MANUAL OF CARPENTRY

American Steel & Wire
Division of
United States Steel

MANUAL OF CARPENTRY

foreword

The purpose of this brief *Manual of Carpentry* is to provide a quick-reference source of fundamental carpentry, tools and materials knowledge for the average layman. In addition, the experienced builder or carpenter will find the text a handy reminder and will have considerable use for the information incorporated in the various tables.

INDEX

chapter 1

LUMBER

Qualities—Lumber is generally classified according to hardness, toughness, and flexibility. These qualities are interdependent on each other. Hardness is a measure of compression which a piece of lumber undergoes when weight is applied to it. Toughness refers to its ability to withstand sudden shocks or loads. Flexibility is indicated by the extent a piece of lumber will bend before breaking. Durability refers to the natural resistance of wood to decay.

Seasoning—Controlled drying or seasoning is applied to lumber prior to use for structural purposes. This eliminates undesirable shrinking and warping which occurs when green lumber is used. It also adds strength and reduces dead weight.

Sizes—To afford uniformity in planning and construction, lumber is cut in standard lengths, widths, and thicknesses. Commercial lengths usually range from 8 to 20 feet. Common widths and thicknesses, and also board feet in typical cross sections and lengths are listed in tables in the back of this manual.

Grading—Ordinary building (yard) lumber is classified Select or Common according to its qualities for different uses.

Select Lumber—Letter designations usually apply to grades intended for finishing purposes. A and B are practically clear and suitable for natural finishes. C and D allow defects that can be concealed by paint.

Common Lumber—Contains features affecting appearance, but is intended for general utility and construction. Numbered grades are divided according to quality:

No. 1 Common—Allows sound, tight knots limited in size depending on the size of the piece. Other defects not materially affecting strength are permitted.

No. 2 Common—Allows more large knots than No. 1 Common. Some decay and a limited number of small holes and loose or unsound knots are permitted. Uses include sheathing, subfloors and concrete forms.

No. 3 Common—Larger, coarser defects and more decay than No. 2 Common. Primary uses: temporary construction and rough work.

Structural Lumber—Finds use where working stresses are required (at least 2″ thick, 4″ wide). Grading depends on strength and intended use of individual pieces.

chapter 2

TOOLS

In carpentry work, as in other fields, the three basic essentials are know-how, materials, and tools. While the resultant finished product reflects varying degrees of these factors, excellent work can be turned out with considerably less than 100 percent fulfillment of any one of these. Assuming average ability and the availability of materials, the layman should have access to certain basic tools. The purpose of this chapter is to identify these tools and briefly explain their use.

MEASURING DEVICES

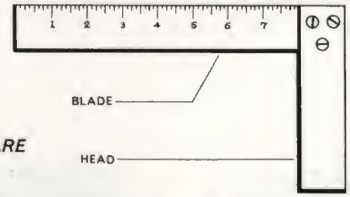
Measuring devices are the first essential in turning out work with any degree of accuracy.

Rules—Ordinary straight-edge rules range from 6 to 36 inches, with folding rules from 1 to 6 feet. Flexible steel rules are available in considerably greater lengths Cloth rules have a tendency to stretch and should not be used where accuracy is essential.

Square—The steel framing square consists of two arms forming a 90 degree angle. The larger arm or blade is usually 24 inches long, while the smaller arm or tongue ranges from 14 to 18 inches in length. Information on various angles is indicated on the markings. The blade should be held along the edge of the lumber so that the tongue extends along the face.

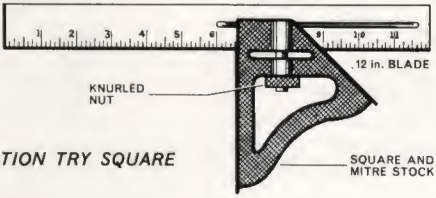
STEEL FRAMING SQUARE

Try Square—This is smaller than the framing square, with the blade graduated in fractions of an inch. It is used for making angles and squaring off small pieces of wood.



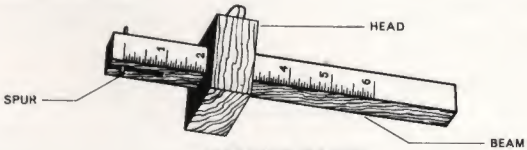
TRY SQUARE

Combination Try Square—This is a versatile measuring tool with an adjustable handle which can be used to lay out and check 90- and 45-degree angles.



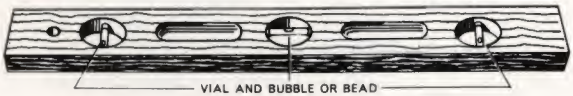
COMBINATION TRY SQUARE

Marking Gauge—The marking gauge is a wooden tool with an adjustable head and a metal scriber. It is used for marking lines parallel to an edge.



MARKING GAUGE

Level—Checking for horizontal and vertical accuracy requires the use of a level. Constructed of hardwood or metal, these usually run from 12 to 30 or more inches in length, with one or more true-surface edges.

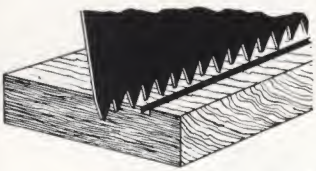


CARPENTER'S LEVEL

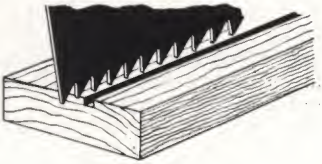
SAWS

Handsaws come in a variety of types, each of which is designed for certain particular needs in carpentry work. The more common types are described in the following paragraphs:

Crosscut Saw—This type of saw is used to cut across the grain. It is also used on wet or soft wood. The teeth are set in triangular form, with the front of each tooth filed to a 15-degree angle and the back to a 45-degree angle.



HOW A CROSSCUT SAW CUTS

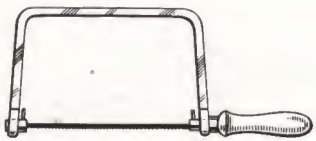


HOW A RIPSAW CUTS

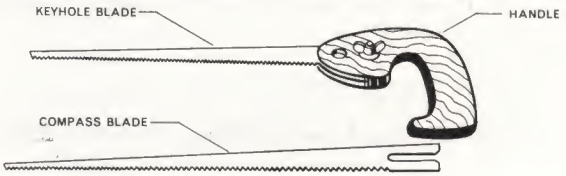
Ripsaw—The ripsaw cuts wood along the grain. Slightly heavier than the crosscut saw, its teeth are chisel shaped, the front being filed to an 8-degree angle and the back to a 52-degree angle.

Coping Saw—This saw is used for cutting curves and other types of fine work. Held in the frame under tension, the blade can be turned so as to cut at various angles. Blades are inexpensive and can be removed when dull or broken.

COPING SAW



Compass and Keyhole Saws—Similar in construction, these saws taper to a point at the front of the blade. They are used primarily to cut along curved lines and to start cuts for larger saws.

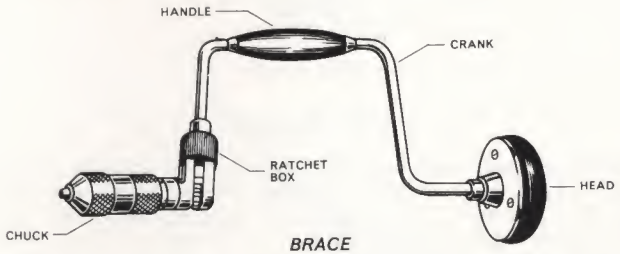


COMPASS AND KEYHOLE SAWS

BRACE AND BIT

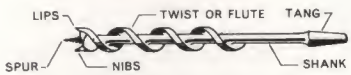
The brace and bit is useful for boring and reaming holes, counter-sinking, and for driving or removing screws and bolts. Various types of bits are designed for these different applications. Brace bits are equipped with a square shank.

Brace—The brace is the tool which holds the various types of bits. It consists of a head or wooden knob, a crank to provide mechanical leverage, a ratchet box to control the turn of the chuck, and the chuck which grips the bit.

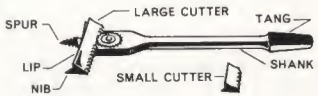


BRACE

Auger Bit—Used for ordinary boring in wood, the auger bit is about 8 inches long, with a screw or spur at the tip so as to direct the vertical cutters which do the actual boring.



AUGER BIT



EXPANSION BIT

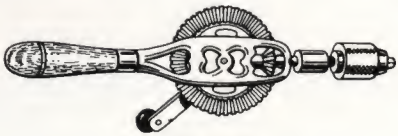
Expansion Bit—This is a bit with an adjustable cutting section, used mainly for boring larger holes than the auger bit. As such, it takes the place of several large bits.

Countersink Bit—A counter-sink has a rose-head point. It is used to bore conical holes so that the tapering heads of screws will fit flush with the surface of the wood.

COUNTERSINK BIT

Twist Drill and Screwdriver Bits—A twist drill is used for boring small holes for nails, screws or bolts. A screwdriver bit is just what the name implies. The brace affords greatly increased speed and mechanical leverage in driving screws and bolts.

Hand Drill—This tool is used for drilling holes in wood or metal. Hand drill bits are equipped with a round shank instead of square.



HAND DRILL

CHISELS

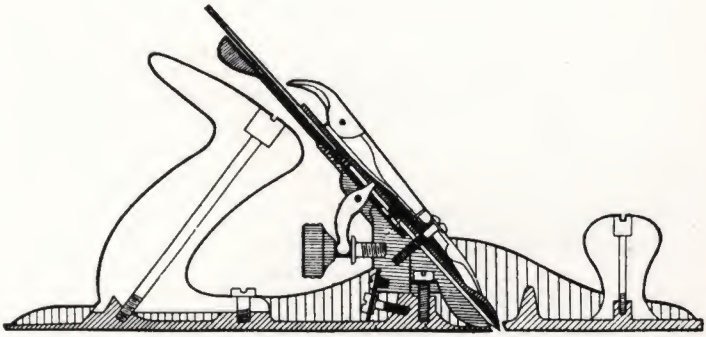
Wood chisels are used for removing chips or sections of wood. The two most common types are the firming chisel, the cutting edges of which vary from ⅛ to 2 inches, and the framing chisel, with cutting edges ranging from 1 to 2 inches. The latter is heavier in construction and is used for heavy work. A wood- or leather-head mallet should always be used for striking a chisel.

HOW TO USE A CHISEL

PLANES

Planes are used to smooth the edge or surface of lumber. Several types are available.

Bench Planes—There are three general types of bench planes: fore, jack, and smoothing. The fore plane is used to true the surface or edge of lumber. Shorter in length, but otherwise similar, the jack plane is frequently substituted for the fore plane. The smoothing plane, being shortest of the three, is used for end-grain planing and for small work requiring a high degree of smoothing.



BENCH PLANE

Block Plane — This plane is considerably smaller than bench planes. It is used for planing across grain or edges of small lumber and also in the making of close joints.

FILES

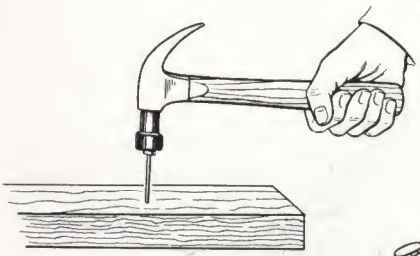
A wood file is used for smoothing work where other tools cannot be used, such as smoothing slots and dressing small joints or handles. Files are available in various lengths, shapes, and spacing of teeth.

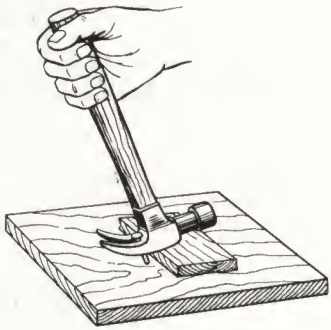
HAMMERS

Hammers of all types have been designed for a great many applications. In carpentry work, the claw hammer is by far the most commonly used. The mallet, which can be classified as a hammer,

is a wooden-headed, short-handled tool for driving chisels, gouges, wooden pins, or small stakes.

Claw Hammer—Claw hammers come in a wide range of sizes and weights. At least two, for light and heavy work, are indispensable in any tool kit. Sharp taps, rather than heavy blows, should be used in driving a nail. Care should be taken to apply the head at the same angle the nail is being driven. This avoids bending the nail. When using the claws to remove long nails the hammer should be supported on a block of wood to provide proper leverage.





DRIVING AND REMOVING A NAIL WITH A CLAW HAMMER

SCREWDRIVERS

Several sizes of screwdrivers are necessary for various work requirements. Using a small screwdriver to drive a large screw, or vice versa, results in poor work, loss of time, and damage to both tool and screw. A screwdriver should never be used for any other purpose than driving screws or bolts.

chapter 3

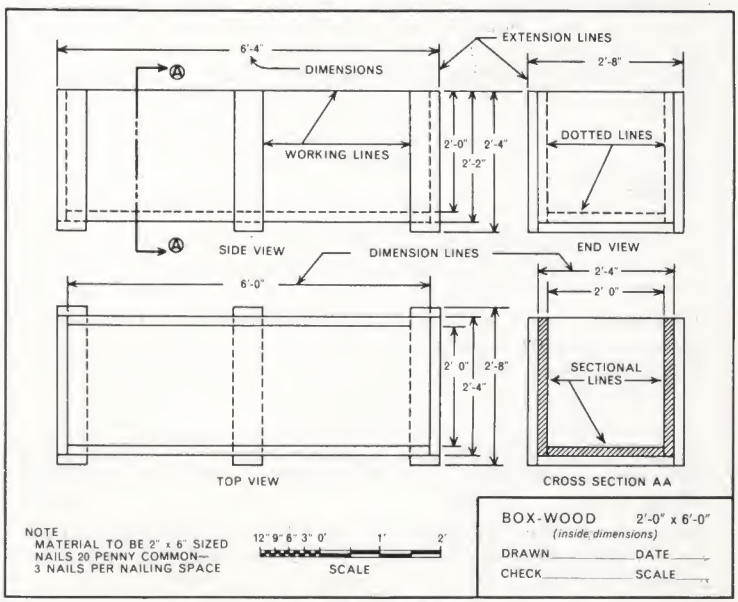
PLANS AND BLUEPRINTS

A carpentry project, if it is to be a job well done, does not "just grow up like Topsy." A plan listing overall sizes, vital dimensions, angles, etc., is essential to good work. Depending on the nature of the project and the degree of accuracy required, the plan may range from a simple list of dimensions to a detailed drawing. For highly complex or extensive work a blueprint should be used, if possible.

BLUEPRINTS

Reproduced on sensitized paper from an original work drawing, a blueprint is a picture of various angles of an object or structure to be built. All dimensions are clearly shown. Letters, lines, and objects appear in white on a blue background.

Explanation of Lines—Heavy or working lines represent surface edges; light lines indicate dimensions between points and are



TYPICAL BLUEPRINT

known as dimension lines. Dotted lines show surface edges hidden from sight when the object is viewed from the side shown. Working lines may be extended beyond proper length to accommodate the drawing of dimension lines in the event the latter cannot be placed in the view proper. Known as extension lines, they are always separated from the actual working lines by a slight break. Section lines are a series of closely spaced parallel lines set at an angle to the working lines. They represent what would be seen if that particular portion of the view were removed.

Marginal Data—Marginal data on blueprints cover such items as title or name of object represented, type and use of certain materials, scale, pertinent construction details, etc. The scale refers to the relative size of the blueprint view as compared to the actual object.

Abbreviations and Symbols—These are covered in the table of abbreviations and symbols in the back of this manual.

Reading Procedure—In reading a blueprint the title should be read first, followed by other marginal data and the scale. The various views are studied next, then attention is given to the dimensions. On many blueprints notes are placed where applicable, in the event special instructions are necessary or desirable. For a complex project, detail drawings are normally provided. These should be studied following the reading of the main blueprint.

chapter 4

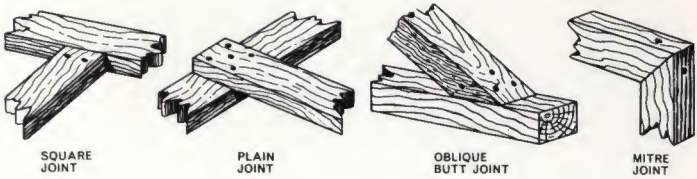
JOINTS, SPLICES AND FASTENING DEVICES

In carpentry work, connections are classified as either joints or splices. Joints are connections which come together at an angle. Splices are connections in which pieces extend in the same line.

JOINTS

Common types of joints are square, plain, oblique, and miter. Each has a certain characteristic suited to various construction needs.

Square Joint—Most simple in construction, the square joint consists of two pieces fastened firmly together with the end of one against the side of the other. Square joints are used where the stress is compressive, such as sills, on fences, etc.



TYPES OF JOINTS

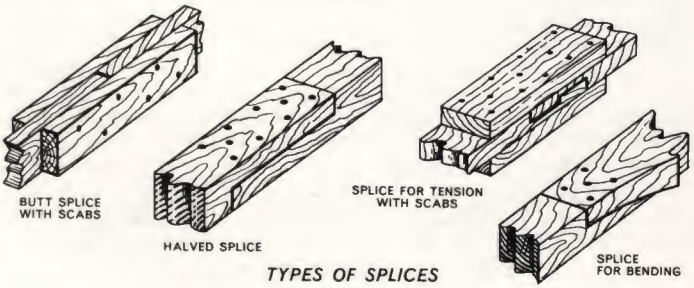
Plain Joint—Used primarily in hasty construction and made by lapping one piece over another and nailing them together, the plain joint can be formed at almost any angle and requires no squaring or straight edges. It is obviously not a strong joint and, therefore, not suited where considerable tension or compression is exerted.

Oblique Joint—This joint is made when connecting pieces do not meet at right angles, such as in bracing. One piece is cut at an angle to fit the side of the other, and the two are securely fastened. Since the strength of the oblique joint depends on the medium by which it is fastened, this is a limiting factor in its resistance to stresses.

Miter Joint—The miter joint joins two pieces that connect as in a corner. The angle is usually, but not necessarily, 90 degrees. For a 90-degree angle, each piece is cut at 45-degrees. Accuracy in cutting is essential. The miter joint is used for interior finishing and for permanent frame or bridge work.

SPLICES

The purpose of a splice is to connect two or more pieces so as to form the equivalent of a single piece. Splices are classified according to the requirements for which they are used, namely: compression, tension, and bending.



TYPES OF SPLICES

Compression—The fished splice and the halved splice are the most commonly used for this purpose. When connected with a fished splice, the pieces are butted together, with short pieces or scabs placed over the break on either side. For best results, nails or screws are driven through the scabs at an angle. Bolts can be used. The halved splice is made by notching the connecting splices half-way to any desired length. The use of scabs increases the all-around strength of the splice. The halved splice is superior to the fished splice.

Tension—By far the most common splice used for tension purposes is the square splice. It is a modification of the halved splice, with an extra notch to prevent slipping. Properly made, it is highly efficient. The use of scabs increases its strength. The square splice is used for trusses, braces, joists, etc. The long lap splice is simpler and quicker to make, but is used primarily in hasty construction, since it is less efficient than the square splice.

Bending—The connecting of pieces subjected to a bending stress is made with a splice combining both compression and tension features. The pieces are cut at mating angles, with, however, the top piece being squared at the tip and the bottom piece beveled tangent to the hypotenuse so that both an angular and square mate is accomplished. Thus, the top piece provides maximum resistance to compression stresses. Tension stresses on the lower piece, which tend to pull the connection apart, are corrected by securing a scab to that section.

FASTENING DEVICES

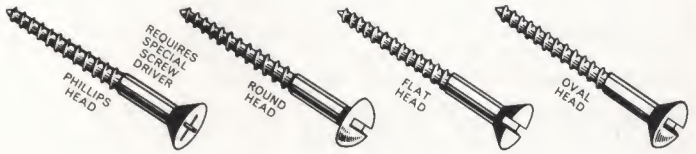
Nails, screws, bolts, corrugated fasteners, mending plates, and various glues are commonly used fastening devices.

Nails—Nails are classified as wire nails or cut nails, the former being more generally used and best suited to average needs. The most common types of wire nails are common, finishing, and flooring. Names infer the application of each. Sizes are designated by the term, penny. Nails under 2d (1 inch long) are classified as brads, nails, or tacks and are measured by the fraction of the inch. Tables in the back of this manual provide data on sizes of nails, number per lb., and kinds and quantities required for various types of work. Full information on nails of all types is provided in the *Catalog of U.S.S. American Nails* available from the American Steel and Wire Division, Cleveland 13, Ohio.

COMMONLY USED TYPES OF NAILS

WOOD SCREWS

Wood screws provide some advantage over nails, such as strength and less danger of splitting, but are more expensive and require considerably more time to install. Common types of screws are: round head, flat head and oval head. These may be slotted or may have Phillips head. The latter requires a Phillips screwdriver. For recommended practices in driving screws, consult the paragraph on screwdrivers in Chapter III.



TYPES OF WOOD SCREWS

BOLTS

The advantage in using bolts lies in the easy disassembly of a structure, or part thereof, on which they are used. They are, however, comparatively expensive and require considerable time in installation. The hole must be first drilled, the bolt applied and then secured with a nut. One type, known as an expansion bolt, is equipped with a hinged shield-nut which expands as the bolt is applied, thereby fastening more securely.

CORRUGATED FASTENERS AND MENDING PLATES

Corrugated fasteners are strips of corrugated steel sharpened at one edge so they can be driven into the wood. They are very useful in joining joints or splices. Mending plates, available in many shapes and sizes, are metal plates with counter-sunk holes so that they can be nailed or screwed into the wood to reinforce joints or splices.

GLUES

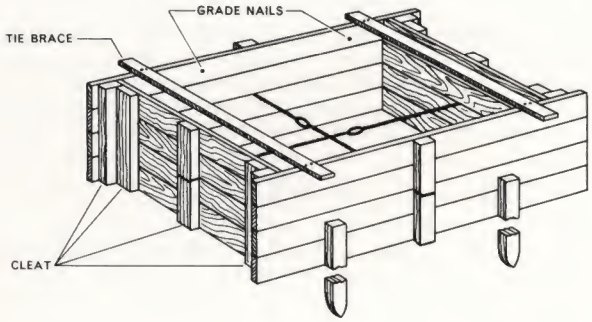
Glues are classified as hot, powdered or liquid. Hot glue (animal glue) makes a very strong joint, but must be heated before use and is not water resistant. Powdered glues are generally water resistant, but must be mixed with water before use. Many liquid glues come ready to use. Some cure at room temperature; however, others require higher temperature cures.

chapter 5

CONCRETE FORMS

Certain essential factors should be considered in the designing and building of concrete forms. They must have strength and stiffness to support the dead load of the concrete and also the live load involved in the construction work. Erection and stripping should require a minimum amount of labor. It is highly important that stripping be accomplished without damage to the concrete. The forms should be made as economically as possible. They should be light in weight, using only the minimum amount of lumber consistent with safeness and strength.

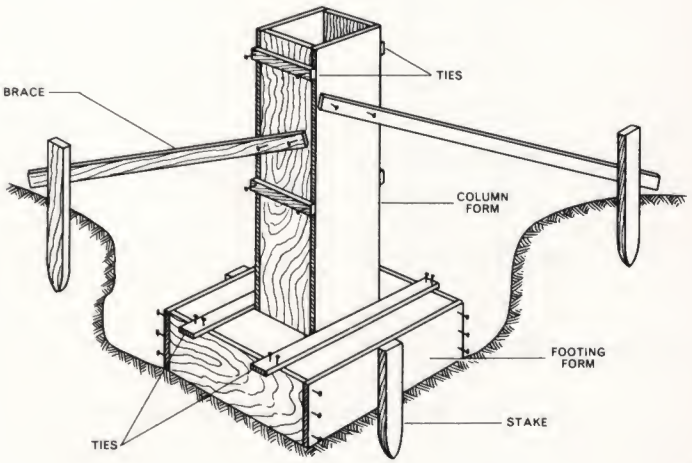
Footings—The four sides are built up as panels, with two of the opposite panels made to exact footing width, with the sheathing fastened to vertical cleats, preferably spaced 2 ft. on centers. According to the thickness of the cleats, a cleat should be placed that distance from the end of each panel. The end cleats on the other pair of panels are placed on the inside and spaced the length of the footing, plus at least twice the sheathing thickness. Outside cleats are placed at equidistant intervals as needed. Thus constructed, the two pairs of panels will fit snugly together and will support each other. The form is held together with wires extending across the inside of the form from opposite center cleats. The wires are made taut by twisting. Care should be exercised in drilling holes in the sheathing where the wire is fastened to the cleats. These should be no more than ½ in. in diameter to prevent seepage of concrete. If the form is 4 ft. square



FOOTING FORM

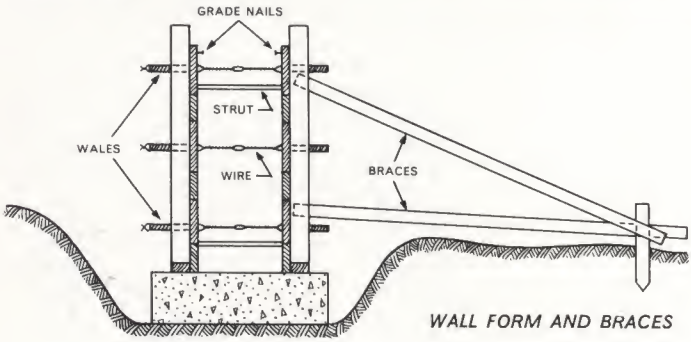
or more, stakes should be driven into the ground on the outside of the long panels, with braces at the top to prevent spreading. Panel depth need not be cut down to footing depth, since nails or similar contrivances can be used to mark the top of the concrete level. When footings are 2 ft. square or less and 1 ft. or less in depth, boards for two opposite sides are cut to footing width and the other pair to footing width, plus twice sheath thickness. The boards are then nailed together with form nails or partially-driven common nails, thus facilitating stripping.

Columns—The average column form is constructed in the same manner as smaller footings, the boards being cut to the height of the column or in sections, depending upon the height of the column. Two ties, long enough to cross the footing form, are nailed edgewise to the longer panels at the bottom of the column form. The column form is then centered and the ties are nailed to the edges of the footing form. Column-width ties are secured along the height of the column form at about 3-ft. centers to prevent bulging. They are nailed at the ends of the longer panels so that the nails are driven into the side of the shorter panels. Wooden braces are angled from the end of the longer panels to stakes driven in the ground and securely nailed at both ends.



COLUMN FORM

Walls—The first step is to determine the approximate dimensions to which the form must be built. This is done to determine the dimensions of the studs, the size and spacing of which varies according to the thickness of the wall. Sheathing is usually made of lumber of varying widths and about ¾ in. thick. For lengths of less than 16 ft., the studs are first placed and then the lumber is nailed to them. For longer walls, the forms are made in sections, with studs flush at each end. Thus, the forms can be fastened together by nailing the studs of adjoining sections. Studs, of course, vary in height according to the wall, but otherwise are usually 2 by 4 in. Horizontal studs or wales are nailed to the outside of the vertical studs to accommodate fastening of wire ties. They cut across the form at top and bottom, and are handled much the same as in footings. Struts are placed at the top and the bottom of the panels to hold them apart while the wires are tightened. Braces, extending from top and bottom at the end of the forms, are constructed in the same manner as with columns. The form should be a few inches higher than the actual wall, with the proper height marked every 4 or so feet with nails or similar contrivances.



WALL FORM AND BRACES

chapter 6

ESTIMATING MILLWORK

Contractors, painters, jobbers, carpenters and architects are sometimes unable to list millwork in mill terms. The following sequence by which building material men can readily list millwork for a complete house will be found very helpful.

This arrangement is a progressive one; that is, you start with the first items needed and by listing the ones needed next, the estimator proceeds the same as if he were constructing a building.

If all contractors, builders, carpenters and architects would submit a millwork list to the mills instead of a plan, they would get a price without a list of omissions that causes quite a bit of trouble at the end of the contract and in some cases a lawsuit.

There is no set rule for figuring material, but by following an arrangement that covers all items, there is very little danger of missing anything. Though siding is not millwork, technically, it has been included in this specification sequence as a check.

The following sequence was used for all types of building from a one car garage to an elaborate residence.

There are several things to remember on all millwork items and should never be omitted. They are:—the kind of wood, the width, the height and the thickness. All sizes and descriptions of articles given in this text are for example only.

Many millwork manufacturers have catalogs and standard millwork lists. These should be referred to in ordering whenever possible.

SEQUENCE

A. FRAMES

1. Cellar
2. Door
3. Window
4. Plank
5. Casement
6. Louver
7. Garage
8. Brick arch centers

B. CORNICE

9. Gable
10. Gutter
11. Belt
12. Outside base
13. Panel strips
14. Half timber
15. Corner boards

C. EXTERIOR MILLWORK

16. Hoods
17. Brackets
18. Porches
19. Rough sawn siding
20. Wavy cut siding

D. INTERIOR MILLWORK

21. Plaster grounds
22. Windows and sash
23. Exterior doors
24. Interior door frames
25. Interior door trim
26. Interior doors
27. Window trim
28. Interior mouldings
29. Case work
30. Stairs

1. Cellar frames (state kind of wood)

Commonly matched with sash and sold as basement window units. This for guidance in ordering separately.

1 Plank cellar frame 10 x 14. 3-light—1⅜ rabbet jamb. 1¾ x 5¼ with brick mould for 8″ concrete wall,

OR 1 Steel cellar sash and frame 10 x 20—3-light.

2. Door frames (state kind of wood)

1 Wood door frame 3-0 x 7-0. 1¾ rabbet jamb. 1¾ x 5½ outside casing. 1⅛ x 4¼ oak sill. 1¾ thick for 6″ frame wall,
OR 1 Wood door frame 3-0 x 7-0. 1¾ rabbet jamb. 1¾ x 5½ outside casing. 1⅛ x 4¼ beveled for stucco. 1¾ oak sill, for 6″ frame stucco wall,
OR 1 Wood door frame 3-0 x 7-0. 1¾ rabbet jamb. 1¾ x 5½ with 1⅜ x 1¾ brick mould for 9″ brick wall.

3. Window frames (state kind of wood)

These are commonly matched with sash and sold as composite window units, "knocked down" or "set up." In such cases, frame design is influenced by weather strip and balancing device, and detailed frame specifications are not needed. It is simply necessary to specify the window unit by name or number, the modular and rough stud opening, and the jamb width.

When not purchased as a window *unit,* dimension of frame components should be given, including head jamb, head parting stop, head blind stop, head casing, drip cap, side jamb, side parting stop, side blind stop, side casing, sill, sill connector, and mull casing. Species and opening size should also be given, and whether components should be water-repellent-preservative treated or not.

4. Plank frames (state kind of wood)

1 Plank sash frame 24 x 36. 1⅜ rabbet–1-light jamb. 1⅜ x 5¼ with brick moulding for 9″ brick wall,
OR 1 Plank sash frame 24 x 36. 1⅜ rabbet–1-light jamb. 1⅜ x 5¼ with 1⅛ x 4¼ outside casing for 6″ frame wall,
OR 1 Plank sash frame 24 x 36. 1⅜–1-light jamb. 1⅜ x 5¼ with 1⅛ x 4¼ outside casing beveled for stucco.

5. Casement sash frames (state kind of wood)

Commonly matched with sash and sold as unit. This for guidance in ordering separately.
1 Casement sash frame for pair sash, each sash 14 x 36. 1⅜–1-light with brick mould for 9″ brick wall,
OR 1 Casement sash frame for pair sash, each 14 x 36. 1⅜–1-light with 1⅛ x 4¼ outside casing for 6″ frame wall,
OR 1 Casement sash frame for pair sash, each sash 14 x 36. 1⅜–1-light with 1⅛ x 4¼ outside casing beveled for stucco.

6. Louver frames (state kind of wood)

1 Louver frame 24 x 36 for 9″ brick wall,
OR 1 Louver frame 24 x 36 for 6″ frame wall,
OR 1 Louver frame 24 x 36 for 6″ frame stucco wall.

7. Garage frame (state kind of wood)

1 Garage door frame 8-0 x 7-6. 1¾ rabbet jamb. 1¾ x 5¼ with brick mould for 9″ brick wall,
OR 1 Garage door frame 8-0 x 7-6. 1¾ rabbet jamb. 1¾ x 5¼ with 1⅛ x 4¼ outside casing for 6″ frame wall,
OR 1 Garage door frame 8-0 x 7-6. 1¾ rabbet jamb. 1¾ x 5¼ with 1⅛ x 4¼ outside casing for 6″ frame stucco wall.

8. Brick arch centers (state kind of wood)
Give width of opening, then height and radius and state the thickness of the brick or stone wall.

9. Gable cornice (state kind of wood)
Lineal feet 3/4 x 1 3/8 edge strip
Lineal feet 3/4 x 7 1/2 S 4 S barge
Lineal feet 3/4 x 3 1/2 crown moulding or barge mld.
Lineal feet 5/8 x 3 1/4 soffit (?) boards wide
Lineal feet 3/4 x 1 3/8 bed mould
Lineal feet 3/4 x 5 1/2 frieze

10. Gutter cornice (state kind of wood)
Lineal feet 3/4 x 7 1/2 facia
Lineal feet 5/8 x 3 1/4 soffit (?) boards wide
Lineal feet 3/4 x 1 3/4 bed mould
Lineal feet 3/4 x 5 1/2 frieze

11. Belt (state kind of wood)
Lineal feet 1 1/8 x 1 3/4 water table or drip cap
Lineal feet 3/4 x 7 1/2 S 4 S

12. Outside base (state kind of wood)
Lineal feet 1 3/8 x 1 3/4 base cap or drip cap
Lineal feet 3/4 x 7 1/2 S 4 S

13. Panel strips (state kind of wood)
Lineal feet 1 3/8 x 3 1/2 panel strip, both edges keyed or beveled for stucco.

14. Half timber (state kind of wood)
In listing half timbering, give lineal feet or pieces and length and state thickness, kind of wood, and if rough sawn, S 4 S or hand edged, and if edges are chamferred.

15. Corner boards (state kind of wood)
Lineal feet 1 1/8 x 3 1/2 S 4 S
Lineal feet 3/4 x 3/4 quarter round

16. Hoods (state kind of wood)
In listing hoods, give size of brackets and distance out from wall and give a pencil sketch.
List gable cornice same as item No. 9.
List gutter cornice same as item No. 10.
List hood ceiling and give amount in board feet.

17. Brackets (state kind of wood)
Cornice brackets, etc.—list same as hood brackets and give pencil sketch.

18. Porches (state kind of wood)

In listing porch material, it is best to list the porch complete.
Gable cornice same as item No. 9.
Gutter cornice same as item No. 10.
Lintels, give width, height and length.
Ceiling, give size of material and board feet measure.
Bed mould, give size and amount in lineal feet.
Columns, give size and height and state if plain or panelled.
Newels, give size and height and state if plain or panelled.
Pilasters, give size and height.
Porch rail, give length and height, state size of balusters and if nailed up.
Flooring, give size and amount in board feet measure.
Base, give size and amount in lineal feet.
Cove, give size and amount in lineal feet.
Lattice panels, give size—width first, height next.
Give dimension of frame material and then the size of the lattice strips and state if they are to run diagonally or horizontally and vertical.

19. Rough sawn siding (state kind of wood)

Give amount in feet board measure.
Give thickness and width, and state rough sawn.

20. Wavy cut siding (state kind of wood)

Give amount in feet board measure.
Give thickness and width and state lower edge cut wavy.

21. Plaster grounds (state kind of wood)

(a) Give number of sets of window grounds and state size.
(b) Give number of sets of door grounds and state size.
(c) Give lineal feet of base grounds and state size.
(d) Give lineal feet of wainscot grounds.
(e) Give lineal feet of picture mould and cornice grounds and give size.
(f) Plastered arch centers, give size.

Example, 1 Plaster arch center 3-0 wide, 4″ stud wall cut on 4-0 radius.

22. Windows and sash

Sizes below are glass openings—list width first, then height. State kind of wood, if check rail and lugs are wanted for 2-light windows.

(a) 1 plank cellar sash 10 x 20. 3-light—1⅜.
(b) 1 window 28 x 26, 1⅜—2-light, check rail and lugs,

OR 1 window 28 x 26, 1⅜—2-light, check rail and lugs. Top sash cut 3-lights wide,

OR 1 window 26 x 26, 1⅜—2-light, check rail and lugs. Top sash cut 3 wide, 2 high.

(c) 1 pair casement sash, each sash 14 x 26, 1⅜—1-light,

OR 1 pair casement sash, each sash 14 x 26, 1⅜—1-light. Divided 2-lights wide, 4-lights high.

(d) 1 plank sash 24 x 26, 1⅜—1-light,
OR 1 plank sash 24 x 26, 1⅜—1-light divided 4-lights wide,
OR 1 plank sash 24 x 26, 1⅜—1-light. Divided 4-lights wide, 2-lights high.

(e) 1 transom 32 x 9, 1⅜—1-light.

ALSO specify type of balance desired. State whether sash is to be preservatively treated and open or glazed. If glazed, type of glazing should be given.

23. Exterior wood doors

Give width, height and thickness. Give size of glass, and if divided; give description of door below the glass and state kind of wood; also give pencil sketch.

Example:

1 door 3-0 x 7-0. 1¾—1-light. Top, 24 x 36 div. 2 wide, 3 high, lower section of door to have 3 cross raised panels, all white pine.

24. Interior wood door frames

Give width, height and rabbet. Give thickness of jamb and width, and state kind of wood.

Example:

1 inside door frame 2-6 x 6-8. 1⅜ rabbet jamb. 1⅜ x 5⅜ Y.P.

25. Interior wood door trim

Give design and dimensions and kind of wood; and list out in sets.

Example: Back band trim

1 side 3-0 x 7-0	1 side 2-6 x 6-8
1 side 2-6 x 6-8	1 side 2-4 x 6-8

26. Interior wood doors

State kind, species, stock number (where applicable) and give dimensions, such as:

1 ponderosa pine ND-103 door, 2′8″ x 6′8″ x 1⅜″
OR 1 hollow core flush door, select birch faces, matching styles, 2′6″ x 6′8″ x 1⅜″ (no stock number required).

27. Wood window trim

Give design and dimensions, and kind of wood and list out in sets.

Example:

Back band design.
1 side 26 x 26—2-light.
1 side plank sash trim 24 x 26—1-light.
1 side casement sash trim for pair sash, each sash 24 x 36—1-light.
(Note) Window trim with jamb lining for 13″, 15″ and 18″ walls should be listed here and stated with each set for the certain thickness of walls.

28. Interior mouldings

(a) List threshold, give length and kind of wood.
(b) Cornice mould, amount lin. ft. and kind of wood.
(c) Base, amount lin. ft., size, design and kind of wood.
(d) Shoe, amount lin. ft., size, design and kind of wood.
(e) Closet base, amt. lin. ft., size, design and kind of wood.
(f) Closet shoe (amt. lin. ft., size, design and kind of wood).
(g) Picture mld. (amt. lin. ft., size, design and kind of wood).
(h) Chair rail (amt. lin. ft., size, design and kind of wood).
(i) Hood strip (amt. lin. ft., size, design and kind of wood).
(j) Shelving (amt. lin. ft., size, design and kind of wood).
(k) Cleat (amt. lin. ft., size, design and kind of wood).
(l) Ceiling beams (amt. lin. ft., size, design and kind of wood).
(m) Cedar closet lining. Give ft. board measure.

29. Case work

(a) Medicine case—state whether of metal or wood, size or stock number; size of glass and stud opening.
(b) Kitchen cases—state kind of wood, width, height and depth of top section, and also depth of lower section; also, if back is to be of wood or plaster, and if case is to set in recess, or if ends are exposed and paneled—it is best to give a pencil sketch, or if taken from catalog, give stock number.
(c) Mantel shelf—state kind of wood, width of mantel breast, depth of shelf, thickness and if ends are returned.
(d) Bookcases—state kind of wood, width, height and depth, kind of doors, number of shelves and if case is to set in recess, or if ends are exposed.
(e) Window seats—state kind of wood, length, depth and thickness, and if top is hinged; also height of back, and if paneled. Give height of front and if paneled.
(f) Panels—state kind of wood, width, height and thickness. Give width and thickness of stiles and rails, and state if panel is built up of veneer or solid and raised type.
(g) Ironing boards—state kind of wood, width, height and depth, and give catalog number if possible.
(h) Breakfast nook sets—state kind of wood, and it is best to give size of space into which the set is to go, and mention table and two benches, or table and one bench, as the case may be; and if possible, give stock number or detail.
(i) Phone cabinets—state kind of wood and give catalog number or sketch.
(j) Scuttle door frame and trim—state kind of wood. Give length and width of frame and thickness of door, and kind of trim.
(k) Plumbers door frame and trim—state kind of wood. Give width and height of frame, also width of jamb and thickness of door and kind of trim.

(l) Clothes chute door frame and trim—state kind of wood. Give width and height of frame; also width of jamb and thickness of door and kind of trim.

30. Stairs

In listing stairs, give width, number of treads and risers, kind of wood; also if stairs are box type, open string or closed string. Give stock number of newel and balusters, if any, and sketch of floor plan.

Several items on above list should be subject to measurements by the mill, and should be so stated on list, and mill notified when the items are ready for measure. In general, these items are:—

All case work Mantel shelves Paneling Stairs

chapter 7

ABBREVIATIONS AND SYMBOLS

Abbreviations.—The following abbreviations in connection with lumber are used by the carpenter:

A D—air-dried
a.l.—all length
av.—average
av. w.—average width
av. l.—average length
bd.—board
bd. ft.—board foot (area of 1 square ft. by 1 in. thick)
bdl.—bundle
bev.—beveled
b.m.—board (foot) measure
btr.—better
clg.—ceiling
clr.—clear
CM—center matched (tongue-and-groove joints are made along the center of the edge of the piece)
Com.—common
Csg.—casing
Ctg.—crating
cu. ft.—cubic foot
D & CM—dressed (one or two sides) and center matched
D & M—dressed and matched (dressed one or two sides and tongued and grooved on the edges. Match may be center or standard
D & SM—dressed (one or two sides) and standard matched
D 2S & CM—dressed two sides and center matched
D 2S & M—dressed two sides and (center or standard) matched
D 2S & SM—dressed two sides and standard matched
Dim.—Dimension
D.S.—drop siding
E.—edge
FAS—firsts and seconds, a combined grade of the two upper grades of hardwoods
f.bk.—flat back
fcty.—factory (lumber)
F.G.—flat grain
Flg.—flooring
f.o.k.—free of knots
Frm.—framing
Hdl.—handle (stock)
Hdwd.—hardwood
Hrt.—heart
Hrtwd.—heartwood
KD.—kiln-dried

k.d.—knocked down

lbr.—lumber

lgr.—longer

lgth.—length

lin. ft.—linear foot

L.R.—log run

Lr. MCO—log run, mill culls out

M.—thousand

M.b.m.—thousand (feet) board measure

MCO—mill culls out

Merch.—merchantable

M.R.—mill run

M.s.m.—thousand (feet) surface measure

m.w.—mixed width

1s & 2s—ones and twos, a combined grade of the hardwood grades of firsts and seconds

Ord.—order

P.—planed

Pat.—pattern

Pky.—pecky

Pln.—plain (plain sawed)

Pn.—partition

Qtd.—quartered (reference to hardwoods)

rnd.—round

rdm.—random

res.—resawed

rfg.—roofing

Rfrs.—roofers

rip.—ripped

r.l.—random length

r.w.—random width

S & E—surfaced one side and one edge

S1E—surfaced one edge

S1S1E—surfaced one side and one edge

S1S2E—surfaced one side and two edges

S2E—surfaced two edges

S4S—surfaced four sides

S & CM—surfaced one or two sides and center matched

S & M—surfaced and matched (surfaced one or two sides and tongued and grooved on the edges. Match may be center or standard).

S & SM—surfaced one or two sides and standard matched

S2S & CM—surfaced two sides and center matched

S2S & M—surfaced two sides and standard or center matched

S2S & SM—surfaced two sides and standard matched

Sap.—sapwood

SB—standard bead

Sd.—seasoned

Sdg.—siding

Sel.—select

S.E.Sdg.—square-edge siding

s.f.—surface foot; (area of 1 square foot)

Sftwd.—softwood

Sh.D.—shipping dry

Ship.—shiplap

Sm.—standard matched

s.m.—surface measure

s.n.d.—sap no defect

snd.—sound

sq.—square

sq.E.—square edge

sq. E & S—square edge and sound

sqrs.—squares

Std.—standard

stk.—stock

S.W.—sound wormy

T & G—tongued and grooved

TB & S—top, bottom, and sides

Tbrs.—timbers

V.G.—vertical grain

w.a.l.—wider, all length

wdr.—wider

wt.—weight

wth.—width

ARCHITECTURAL SYMBOLS

Tile
Earth
Plaster
Sheet metal
Built-in cabinet
Outside door: Brick wall
Frame wall
Inside door: Frame wall
Brick
Firebrick
Concrete
Cast concrete block
Insulation: Loose fill
Board or quilts
Cut stone
Ashlar
Shingles (siding)
Wood, rough
Wood, finished
Cased or arched openings
Single casement window
Double-hung windows
Double casement windows

PLUMBING SYMBOLS

Bathtubs:
Corner
Free standing
Floor drain
Shower drain
Hot-water tank H.W.T.
Hose bibb or sill cock

Lavatories:
Pedestal
Corner

Toilets:
Tank
Flush valve

Urinals:
Stall-type
Wall-hung

Laundry trays
Built-in shower
Shower S S
Sinks:
Single drain board
Double drain board

ELECTRICAL SYMBOLS

Pull switch
Single-pole switch S_1
Double-pole switch S_2
Triple-pole switch S_3
Buzzer
Floor outlet
Bell
Drop cord D
Ceiling outlet
Wall bracket
Single convenience outlet
Double convenience outlet
Ceiling outlet, gas & electric
Light outlet with wiring and switches indicated

chapter 8

GLOSSARY OF TERMS

Anchor — Irons of special form used to fasten together timbers or masonry.

Backing — The bevel on the top edge of a hip rafter that allows the roofing boards to fit the top of the rafter without leaving a triangular space between it and the lower side of the roof covering.

Baluster — A small column used to support a rail.

Balustrade — A row of balusters with the rails, generally used for porches, balconies, etc.

Band — A low, flat molding.

Base — The bottom of a column; the finish of a room at the junction of the walls and floor.

Batten (cleat) — A narrow strip of board used to fasten several pieces together.

Batter board — A temporary framework used to assist in locating the corners when laying out a foundation.

Beam — An inclusive term for joists, girders, rafters, and purlins.

Bedding — A filling of mortar, putty, or other substance in order to secure a firm bearing.

Belt course — A horizontal board across or around a building, usually made of a flat member and a molding.

Bevel board (pitch board) — A board used in framing a roof or stairway to lay out bevels.

Board — Lumber less than 2 inches thick.

Board foot — The equivalent of a board 1 foot square and 1 inch thick.

Boarding in — The process of nailing boards on the outside studding of a house.

Braces — Pieces fitted and firmly fastened to two others at any angle in order to strengthen the angle thus treated.

Bracket — A projecting support for a shelf or other structure.

Break joints — To arrange joints so that they do not come directly under or over the joints of adjoining pieces, as in shingling, siding, etc.

Bridging — Pieces fitted in pairs from the bottom of one floor joist to the top of adjacent joists, and crossed to distribute the floor load; sometimes pieces of width equal to the joist and fitted neatly between them.

Building paper — Cheap, thick paper, used to insulate a building before the siding or roofing is put on; sometimes placed between double floors.

Built-up timber — A timber made of several pieces fastened together and forming one of larger dimension.

Carriages — The supports of the steps and risers of a flight of stairs.

Casement — A window in which the sash opens upon hinges affixed to the vertical edges.

Casing — The trimming around a door or window opening, either outside or inside, or the finished lumber around a post or beam, etc.

Ceiling — Narrow, matched boards; sheathing of the surfaces that inclose the upper side of a room.

Center-hung sash — A sash hung on its centers so that it swings on a horizontal axis.

Chamfer — A beveled surface cut upon the corner of a piece of wood.

Checks — Splits or cracks in a board, ordinarily caused by seasoning.

Clamp — A mechanical device used to hold two or more pieces together.

Clapboards — A special form of outside covering of a house; siding.

Columns — A support, square, rectangular, or cylindrical in section, for roofs, ceilings, etc., composed of base, shaft, and capital.

Combination frame — A combination of the principal features of the full and balloon frames.

Concrete — A combination of sand, broken stone, or gravel, and cement used in foundations, building construction for walks, etc.

Conductors — Pipes for conducting water from a roof to the ground or to a receptacle or drain; downspout.

Cornice — The molded projection which finishes the top of the wall of a building.

Counterflashings — Strips of metal used to prevent water from entering the top edge of the vertical side of a roof flashing; they also allow expansion and contraction without danger of breaking the flashing.

Deadening — Construction intended to prevent the passage of sound.

Drip — The projection of a window sill or water table to allow the water to drain clear of the side of the house below it.

Fascia — A flat member of a cornice or other finish, generally the board of the cornice to which the gutter is fastened.

Flashing — The material used and the process of making watertight the roof intersections and other exposed places on the outside of the house.

Flue — The opening in a chimney through which smoke passes.

Flush — Adjacent surfaces even, or in same plane (with reference to two structural pieces).

Footing courses — The bottom and heaviest courses of a piece of masonry.

Foundation — That part of a building or wall which supports the superstructure.

Frame — The surrounding or inclosing woodwork of windows, doors, etc., and the timber skeleton of a building.

Framing — The rough timber structure of a building, including interior and exterior walls, floor, roof, and ceilings.

Full frame — The old-fashioned mortised-and-tenoned frame, in which every joint was mortised and tenoned.

Furring — Narrow strips of board nailed upon the walls and ceilings to form a straight surface upon which to lay the laths or other finish.

Gable — The vertical triangular end of a building from the eaves to the apex of the roof.

Gage (gauge) — A tool used by carpenters; to strike a line parallel to the edge of the board.

Gambrel — A symmetrical roof with two different pitches or slopes on each side.

Girder — A timber used to support wall beams or joists.

Girt (ribband) — The horizontal member of the walls of a full or combination frame house which supports the floor joists or is flush with the top of the joists.

Groove — A long hollow channel cut by a tool, into which a piece fits or in which it works.

Ground — A strip of wood assisting the plasterer in making a straight wall and in giving a place to which the finish of the room may be nailed.

Ground floor — The floor of a building on a level with the ground or nearly so.

Header — A short joist supporting tail beams and framed between trimmer joists; the piece of stud or finish over an opening; a lintel.

Headroom — The clear space between floor line and ceiling, as in a stairway.

Heel of a rafter — The end or foot that rests on the wall plate.

Hip roof — A roof which slopes up toward the center from all sides, necessitating a hip rafter at each corner.

Jack rafter — A short rafter framing between the wall plate and a hip rafter.

Jamb — The side piece or post of an opening; sometimes applied to the door frame.

Joint-butt — Squared ends or ends and edges adjoining each other.

Dovetail — Joint made by cutting pins the shape of dovetails in which fit between dovetails upon another piece.

Drawboard — A mortise-and-tenon joint with holes so bored that when a pin is driven through, the joint becomes tighter.

Fished — An end butt splice strengthened by pieces nailed on the sides.

Halved — A joint made by cutting half of the wood away from each piece so as to bring the sides flush.

Housed — A joint in which a piece is grooved to receive the piece which is to form the other part of the joint.

Glue — A joint held together with glue.

Lap — A joint of two pieces lapping over each other.

Mortised — A joint made by cutting a hole or mortise, in one piece, and a tenon, or piece to fit the hole, upon the other.

Rub — A flue joint made by carefully fitting the edges together, spreading glue between them, and rubbing the pieces back and forth until the pieces are well rubbed together.

Scarfed — A timber spliced by cutting various shapes of shoulders, or jogs, which fit each other.

Joists — Timbers supporting the floor boards.

Kerf — Cut made by a saw.

Laths — Narrow strips to support plastering.

Lattice — Crossed wood, iron plate, or bars.

Ledgerboard — The support for the second-floor joists of a balloon-frame house, or for similar uses; ribband.

Level — A term describing the position of a line or plane when parallel to the surface of still water, an instrument or tool used in testing for horizontal and vertical surfaces, and in determining differences of elevation.

Lintel (header) — The piece of construction or finish, stone, wood, or metal, which is over an opening; a header.

Lookout — The end of a rafter, or the construction which projects beyond the sides of a house to support the eaves; also the projecting timbers at the gables which support the verge boards.

Louver — A kind of window, generally in the peaks of gables and the tops of towers, provided with horizontal slots which exclude rain and snow and allow ventilation.

Lumber — Sawed parts of a log such as boards, planks, scantling, and timber.

Matching, or tonguing and grooving — The method used in cutting the edges of a board to make a tongue on one edge and a groove on the other.

Meeting rail — The bottom rail of the upper sash, and the top rail of the lower sash of a double-hung window. Sometimes called the check rail.

Miter — The joint formed by two abutting pieces meeting at an angle.

Molding — Base — The molding on the top of a baseboard.

Bed — A molding used to cover the joint between the plancier and frieze; also used as a base molding upon heavy work, and sometimes as a member of a cornice.

Lip — A molding with a lip which overlaps the piece against which the back of the molding rests.

Rake — The cornice upon the gable edge of a pitch roof, the members of which are made to fit those of the molding of the horizontal eaves.

Picture — A molding shaped to form a support for picture hooks, often placed at some distance from the ceiling upon the wall to form the lower edge of the frieze.

Mortise — The hole which is to receive a tenon, or any hole cut into or through a piece by a chisel; generally of rectangular shape.

Mullion — The construction between the openings of a window frame to accommodate two or more windows.

Muntin — The vertical member between two panels of the same piece of panel work. The vertical sash-bars separating the different panes of glass.

Newel — The principal post at the foot of a staircase; also the central support of a winding flight of stairs.

Nosing — The part of a stair tread which projects over the riser, or any similar projection; a term applied to the rounded edge of a board.

Piers — Masonry supports, set independently of the main foundation.

Pilaster — A portion of a square column, usually set within or against a wall.

Piles — Long posts driven into the soil in swampy locations or whenever it is difficult to secure a firm foundation, upon which the footing course of masonry or other timbers are laid.

Pitch — Inclination or slope, as of roofs or stairs, or the rise divided by the span.

Pitch board — A board sawed to the exact shape formed by the stair tread, riser, and slope of the stairs and used to lay out the carriage and stringers.

Plan — A horizontal geometrical section of a building, showing the walls, doors, windows, stairs, chimneys, columns, etc.

Planks or lumber — Material 2 or 3 inches thick and more than 4 inches wide, such as joists, flooring, etc

Plaster — A mixture of lime, hair, and sand, or of lime, cement, and sand, used to cover outside and inside wall surfaces.

Plate — The top horizontal piece of the walls of a frame building upon which the roof rests.

Plate cut — The cut in a rafter which rests upon the plate; sometimes called the seat cut.

Plumb cut — Any cut made in a vertical plane; the vertical cut at the top end of a rafter.

Ply — A term used to denote a layer or thickness of building or roofing paper as two-ply, three-ply, etc.

Porch — An ornamental entrance way.

Post — A timber set on end to support a wall, girder, or other member of the structure.

Plow — To cut a groove running in the same direction as the grain of the wood.

Pulley stile — The member of a window frame which contains the pulleys, and between which the edges of the sash slide.

Purlin — A timber supporting several rafters at one or more points, or the roof sheeting directly.

Rabbet or rebate — A corner cut out of an edge of a piece of wood.

Rafters, common — Those which run square with the plate and extend to the ridge.

Cripple — Those which cut between valley and hip rafters.

Hip — Those extending from the outside angle of the plates toward the apex of the roof.

Jacks — Those square with the plate and intersecting the hip rafter.

Valley — Those extending from an inside angle of the plates toward the ridge or center line of the house.

Rail — The horizontal members of a balustrade or panel work.

Rake — The trim of a building extending in an oblique line, as rake dado or molding.

Return — The continuation of a molding or finish of any kind in a different direction.

Ribband — (See Ledgerboard.)

Ridge — The top edge or corner formed by the intersection of two roof surfaces.

Ridge cut — (See Plum cut.)

Rise — The vertical distance through which anything rises, as the rise of a roof or stair.

Riser — The vertical board between two treads of a flight of stairs.

Roof — The covering or upper part of a building.

Roofing — The material put on a roof to make it wind and waterproof.

Run — The length of the horizontal projection of a piece such as a rafter when in position.

Saddle board — The finish of the ridge of a pitch-roof house. Sometimes called comb board.

Sash — The framework which holds the glass in a window.

Sawing, plain—Lumber that has been sawed in a plane approximately perpendicular to a radius of the log. Lumber is plain sawed when the annual growth rings make an angle of less than 45° with the surface of the piece.

Scaffold or staging — A temporary structure or platform enabling workmen to reach high places.

Scale — A short measurement used as a proportionate part of a larger dimension. The scale of a drawing is expressed as ¼ inch = 1 foot.

Scantling — Lumber with a cross section ranging from 2″ x 4″ to 4″ x 4″.

Scarfing—A joint between two pieces of wood which allows them to be spliced lengthwise.

Scotia — A hollow molding used as a part of a cornice, and often under the nosing of a stair tread.

Scribing — The marking of a piece of wood to provide for the fitting of one of its surfaces to the irregular surface of another.

Seat cut or plate cut — The cut at the bottom end of a rafter to allow it to fit upon the plate.

Seat of a rafter — The horizontal cut upon the bottom end of a rafter which rests upon the top of the plate.

Section — A drawing showing the kind, arrangement, and proportions of the various parts of a structure. It is assumed that the structure is cut by a plane, and the section is the view gained by looking in one direction.

Shakes — Imperfections in timber caused during the growth of the tree by high winds or imperfect conditions of growth.

Sheathing—Wall boards, roofing boards; generally applied to narrow boards laid with a space between them, according to the length of a shingle exposed to weather.

Sheathing paper — The paper used under siding or shingles to insulate the house; building papers.

Siding — The outside finish between the casings.

Sills — The horizontal timbers of a house which either rest upon the masonry foundations or, in the absence of such, form the foundations.

Sizing — Working material to the desired size; a coating of glue, shellac, or other substance applied to a surface to prepare it for painting or other method of finish.

Sleeper — A timber laid on the ground to support a floor joist.

Span — The distance between the bearings of a timber or arch.

Specifications—The written or printed directions regarding the details of a building or other construction.

Square — A tool used by mechanics to obtain accuracy; a term applied to a surface including 100 square feet.

Stairs, box — Those built between walls, and usually with no support except the wall strings.

Standing finish — Term applied to the finish of the openings and the base, and all other finish necessary for the inside of the house.

Stucco — A fine plaster used for interior decoration and fine work, also for rough outside wall coverings.

Studding — The framework of a partition or the wall of a house; usually referred to as 2 x 4's.

Threshold — The beveled piece over which the door swings; sometimes called a carpet strip.

Timber—Lumber 5 or more inches in least dimension.

Tie beam (collar beam) — A beam so situated that it ties the principal rafters of a roof together and prevents them from thrusting the plate out of line.

Tin shingle — A small piece of tin used in flashing and repairing a shingle roof.

To the weather — A term applied to the projecting of shingles or siding beyond the course above.

Tread — The horizontal part of a step.

Trim — A term sometimes applied to outside or interior finished woodwork and the finish around openings.

Trimmer — The beam or floor joist into which a header is framed.

Trimming — Putting the inside and outside finish and hardware upon a building.

Valley — The internal angle formed by the two slopes of a roof.

Verge boards—The boards which serve as the eaves finish on the gable end of a building.

Vestibule — An entrance to a house; usually inclosed.

Wainscoting — Matched boarding or panel work covering the lower portion of a wall.

Wash — The slant upon a sill, capping, etc., to allow the water to run off easily.

Water table — The finish at the bottom of a house which carries the water away from the foundation.

Wind — A term used to describe the surface of a board when twisted (winding) or when resting upon two diagonally opposite corners, if laid upon a perfectly flat surface.

Wooden brick — Piece of seasoned wood, made the size of a brick, and laid where it is necessary to provide a nailing space in masonry walls.

APPENDIX

How to Figure Lumber Board Measure

Lumber is usually reckoned by Board Measures, the unit being a square foot one inch thick.

The ordinary way of finding the contents of squared lumber is to multiply together the length in feet, the width and thickness in inches and divide the product by 12.

Example

A few examples will show the system for finding the contents of standard sizes in a few seconds and many of them without a moment's hesitation.

Example: Find the Board Measure contents of the following sizes:

Pcs.	Size	Length	B.M.
1	2 x 8 inches	30 feet	40
1	4 x 10 inches	18 feet	60
6	4 x 6 inches	36 feet	432

Operation

$$\frac{6 \times 4 \times 6 \times 36}{12} = 432$$

In this equation, the number of pieces (6) is multiplied by the width x thickness x length (4x6x36) and divided by 12. By simple cancellation 12 may be divided into 36 three times. All that remains to be done now, is to multiply 6x4x6x3 which gives the answer 432.

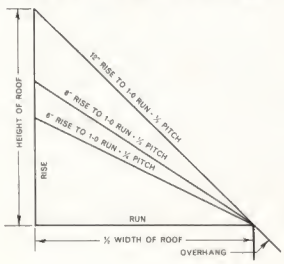
To Convert Board Measure to Lineal Feet, simply reverse the multiple used to bring lineal feet to Board Measure; in other words, multiply Board feet by 12 and divide by thickness and width.

Example: How many lineal feet are there in 1000 feet Board Measure of 2 x 8?

Process:

$$\frac{1000 \times 12}{2 \times 8} = 750 \text{ lineal feet}$$

ROOF PITCHES



This diagram shows the three standard roof pitches that are used by all carpenters who put up buildings. But some good workmen are not sure of all the terms that are used to describe them.

Pitch means the angle or slant of the rafters in a straight line from the eaves to the peak of the roof.

Rise means the vertical elevation of the rafter at a given point. The term "rise" is always used in connection with the term "run." A roof rises a certain number of inches to each foot of the run.

Run is the horizontal measurement from the plate to the center line of the building.

Rise is the vertical climb of the rafter expressed in feet.

For example, the rise of a half pitch roof is equal to the run, which means that the distance from the plate to the center line of the building is the same as the distance from the center line to the peak. The rise of a one-quarter pitch roof is just half as much.

Actuary Way to Figure Roof Spaces

The exact area of any roof, regardless of its shape, no matter how it may be cut up, is accurately determined as follows. Get the exact area from outside to outside of the walls on the level of the plates on which the rafters rest and add for the different roof pitches as follows:

One-fourth pitch add to area on square.....12 per cent
One-third pitch add to area on square.....20 per cent
One-half pitch add to area on square.....42 per cent
Three-eighths pitch add to area on square.....25 per cent
Five-eighths pitch add to area on square.....60 per cent
Three-fourths pitch add to area on square.....80 per cent

To the results thus obtained add the cornice projection all round. This gives the roof area sufficiently accurate for all practical purposes. For illustration, take a third pitch hip-roof—building 30 by 30 or 900 square feet at the square. Adding 20 per cent, or 180, gives 1080 as the roof area, including all dormers but excluding all cornice projections. Had there been a deck 5 by 6, or 30 square feet, then 30 plus 20 per cent should be deducted or 36 feet from 1080-1044 as the roof area, exclusive of deck and cornice projections.

Actuary's Estimate Tables to Find Quantities of Lumber Required

STUDDING on 16 inch centers. Estimate one to the lineal foot. This allows for doubling at openings and at corners.

JOISTS AND RAFTERS on 16 inch centers. To ¾ of the length of the building add 1, thus: For a building 16x32, ¾ of 32 = 24, to which add 1, or 25, being the joists required, or the rafters for 1 side. Add 1 or 2 for each bearing partition.

ROOF SHEATHING LAID SOLID. To full area of roof add 10 per cent for waste. If laid 2 inches apart ¾ of above will be required.

ARTICLE	Count Width	Face Width	Loss in Matching (per cent)	To area to be Covered Add
Shiplap	12 inch	11¼	7	1-12
"	10 "	9¼	8⅓	1-10
"	8 "	7¼	11	1-8
"	6 "	5¼	12½	1-5
Flooring	6 "	5¼	12½	1-5
"	4¼ "	3½	18	¼
"	4 "	3¼	19	¼
"	3 "	2¼	25	⅓
"	2¾ "	2	27	⅓
"	2½ "	2	20	¼
"	2 "	1½	25	⅓

Drop siding, ceiling, and partition same as above.

ARTICLE	Size	Exposed	To area to be Covered Add
Siding, beveled	½x4	3¼ inch	¼
" "	½x4	3 "	⅓
" "	½x4	2¾ "	½
" "	½x5	4¼ "	1-5
" "	½x5	4 "	¼
" "	½x5	3¾ "	⅓
" "	½x6	5¼ "	1-5
" "	½x6	5 "	9-40
" "	½x6	4¾ "	¼

SHINGLES

When exposed

4"	to the weather require 9	to the sq. ft.	Add 1-10 for Waste
4½"	to the weather require 8	to the sq. ft.	
5"	to the weather require 7-1/5	to the sq. ft.	
5½"	to the weather require 6½	to the sq. ft.	
6"	to the weather require 6	to the sq. ft.	

CORNICES. Multiply the total lineal feet, by the combined width of planceer, frieze, and fascia thus: If the planceer is 12 inches, the frieze 8 inches, and the fascia 4 inches, the combined width is 24 inches or 2 feet b. m. to the lineal foot of cornice.

CORNER BOARDS AND OUTSIDE BASE. Estimate on same plan as cornices and then add ¼ if of 1¼" thickness or ½ if of 1½" thickness.

BRIDGING. Multiply the total lineal feet, measuring each string in a straight line by the following:

For 2x6, 2x8 or 2x10 on	16 inch centers by 2
For 2x12	16 inch centers by 2¼
For 2x14	16 inch centers by 2½
For 2x6 and 2x8	12 inch centers by 2
For 2x10 and 2x12	12 inch centers by 2¼
For 2x14	12 inch centers by 2-2/3

LATTICE

1⅛ wide multiply area by 12 for lineal feet required.
1⅜ wide multiply area by 10 for lineal feet required.
1¾ wide multiply area by 8 for lineal feet required.

LATH

Lath when laid ⅜ inch apart, as for lime, require 1½ to the square foot, or 13½ to the square yard to which add 4% for waste, making practically 14 to the square yard. So to find the lath required increase the square feet to be lathed by ½ thus: 900 square feet require 900+½ of 900 or 1350 lath plus 4%=1404.

When laid ¼ inch apart, as for cement plasters, require 7 per cent more lath.

When there are no openings add 10 per cent to amount obtained by above.

TAPERING LUMBER

How to Figure Trapezoids, or Boards With Only Two Parallel Sides

Find the Board Measure contents of a board one inch thick, whose parallel sides are 16 feet and 20 feet in length and 8 inches wide.

Add together the two parallel sides, and divide their sum by 2, multiply the result by the inches in width and divide by 12. The answer is 12 feet Board Measure contents:

Operation:

```
   16
   20
  ---
2) 36
  ---
   18
    8
  ---
12) 144
  ---
   12 ft. Board Measure.
```

Find the Board Measure contents of a board one inch thick, 24 feet long whose parallel ends are 10 inches and 18 inches respectively.

Operation:

10
18

2) 28

14
24

12) 336

28 ft. Board Measure.

TABLE 1

Standard widths and thicknesses of lumber

TYPE OF LUMBER	Nominal size Thickness	(inches) Width	Actual size Thickness	S4S[1] (inches) Width
Dimension	2	4	1⅝	3⅝
"	2	6	1⅝	5⅝
"	2	8	1⅝	7½
"	2	10	1⅝	9½
"	2	12	1⅝	11½
"	2	14	1⅝	13½
"	2	16	1⅝	15½
"	3	6	2⅝	5⅝
"	3	8	2⅝	7½
"	3	10	2⅝	9½
"	3	12	2⅝	11½
"	3	14	2⅝	13½
"	3	16	2⅝	15½
"	4	4	3⅝	3⅝
"	4	6	3⅝	5⅝
"	4	8	3⅝	7½
"	4	10	3⅝	9½

Table 1—Standard widths and thicknesses of lumber —continued

TYPE OF LUMBER	Normal size (inches) Thickness	Normal size (inches) Width	Actual size Thickness	S4S[1] (inches) Width
Dimension	4	12	3⅝	11½
"	4	14	3⅝	13½
"	4	16	3⅝	15½
Timbers	6	6	5½	5½
"	6	8	5½	7½
"	6	10	5½	9½
"	6	12	5½	11½
"	6	14	5½	13½
"	6	16	5½	15½
"	8	8	7½	7½
"	8	10	7½	9½
"	8	12	7½	11½
"	8	14	7½	13½
"	8	16	7½	15½
"	10	10	9½	9½
"	10	12	9½	11½
"	10	14	9½	13½
"	10	16	9½	15½
"	12	12	11½	11½
"	12	14	11½	13½
"	12	16	11½	15½
"	14	14	13½	13½
"	14	16	13½	15½
"	16	16	15½	15½
Common boards	1	4	25/32	3⅝
" "	1	6	25/32	5⅝
" "	1	8	25/32	7½
" "	1	10	25/32	9½
" "	1	12	25/32	11½
Shiplap boards	1	4	25/32	3⅛
" "	1	6	25/32	5⅛
" "	1	8	25/32	7⅛
" "	1	10	25/32	9⅛
" "	1	12	25/32	11⅛
Tongued and grooved boards	1	4	25/32	3¼
" " " "	1	6	25/32	5¼
" " " "	1	8	25/32	7¼
" " " "	1	10	25/32	9¼
" " " "	1	12	25/32	11¼

[1]Surfaced 4 sides

TABLE 2: Sizes of Nails

2d Common
3d "
4d "
5d "
6d "
7d "
8d "
9d "
10d "
12d "
16d "
20d "
30d "
40d "
50d "
60d "

3d Box—Smooth
4d " "
5d " "
6d " "
7d " "
8d " "
10d " "
16d " "
20d " "

2d Lath—Blued
3d " "
3d Lt. Lath—Blued

Wire Spikes—
Flt. Ctsk. Hd.—Dia. Pt.
7" x 5/16"
8" x 5/16"
8" x 3/8"
10" x 3/8"

3d Finishing
4d "
6d "
8d "
10d "

4d Casing
6d "
8d "
10d "
16d "

Flooring Brads
8d Standard
8d Ideal

3d Fine

3d Sinkers—C. C.
4d " "
5d " "
6d " "
7d " "
8d " "
10d " "
12d " "
16d " "
20d " "
30d " "
40d " "
60d " "

3d Coolers—C. C.
4d " "
5d " "
6d " "
7d " "
8d " "
10d " "

3d Box—C. C.
4d " "
5d " "
6d " "
7d " "
8d " "
10d " "

Shingles—Asbestos
Barbed—13/32" Hd.
Long Dia. Pt.
1¼" x 11½
1½" x 11½
1¾" x 11½
2" x 11½

Shingle—Standard
3d—¼" head
3½d—9/32" head
4d—9/32" head
3d—19/64" head

Plaster Base—
Blued—Long Dia. Pt.
1⅛" x 13—19/64" hd.
1¼" x 13—19/64" hd.
1¼" x 12—⅛" hd.

Duplex Head
6d—1¾" x 11½
8d—2¼" x 10¼
10d—2¾" x 9
16d—3" x 8
20d—3½" x 6

Roofing—Barbed—
Bright Regular Head
1" x 12
1¼" x 11

Roofing—Leakproof—
Bright
1¾" x 10
2" x 10

Roofing—Large Head—
Barbed—Bright
⅞" x 11—7/16" Hd.
1" x 11—7/16" Hd.
1¼" x 11—7/16" Hd.
1½" x 11—7/16" Hd.
1¾" x 11—7/16" Hd.
2" x 11—7/16" Hd.
⅞" x 12—⅜" Hd.
1" x 12—⅜" Hd.
1¼" x 12—⅜" Hd.
1½" x 12—⅜" Hd.
1¾" x 12—⅜" Hd.

Roofing—Ideal—Bright
½" Checkered Head
⅞" x 11—Smooth
1" x 11 "
1¼" x 11 "
1½" x 11 "
1¾" x 11 "

TABLE 3
Wire Nails—Kinds and Quantities Required

Length, in inches	American Steel & Wire Division's STEEL WIRE GAUGE No.	Approx. No. to lbs.	Nailings	Sizes and Kinds of Material	Trade Names	Pounds per 1000 feet B. M. on center as follows: 12″	16″	20″	36″	48″
2½	10¼	106	2	1 x 4	8d common	60	48	37	23	20
2½	10¼	106	2	1 x 6	8d common	40	32	25	16	13
2½	10¼	106	2	1 x 8	8d common	31	27	20	12	10
2½	10¼	106	2	1 x 10	8d common	25	20	16	10	8
2½	10¼	106	3	1 x 12	8d common	31	24	20	12	10
4	6	31	2	2 x 4	20d common	105	80	65	60	33
4	6	31	2	2 x 6	20d common	70	54	43	27	22
4	6	31	2	2 x 8	20d common	53	40	53	21	17
4	6	31	3	2 x 10	20d common	60	50	40	25	20
4	6	31	3	2 x 12	20d common	52	41	33	21	17
6	2	11	2	3 x 4	60d common	197	150	122	76	61
6	2	11	2	3 x 6	60d common	131	97	82	52	42
6	2	11	2	3 x 8	60d common	100	76	61	38	34
6	2	11	3	3 x 10	60d common	178	137	110	70	55
6	2	11	3	3 x 12	60d common	145	115	92	58	46
2½	12½	189	2	Base, per 100 ft. lin.	8d finish	.....	1	.....	.....	.....
2½	10¼	106	2	Byrket lath	8d common	.....	48	.....	.....	.....
2½	12½	189	1	Ceiling, ¾ x 4	8d finish	18	14	.....	.....	.....
2	13	309	1	Ceiling, ½ and ⅝	6d finish	11	8	.....	.....	.....
2½	12½	189	2	Finish, ⅞	8d finish	25	12	.....	.....	.....
3	11½	121	2	Finish, 1⅛	10d finish	12	10	.....	.....	.....
2½	10	99	1	Flooring, 1 x 3	8d floor brads	42	32	.....	.....	.....
2½	10	99	1	Flooring, 1 x 4	8d floor brads	32	26	.....	.....	.....
2½	10	99	1	Flooring, 1 x 6	8d floor brads	22	18	.....	.....	.....
4	6	31		Framing, 2x4 to 2x16	20d common	20	16	14	.....	.....
3½	8	49		requires 3 or more	16d common	10	10	8	.....	.....
3	9	69		sizes and vary greatly	10d common	8	6	5	.....	.....
6	2	11		Framing, 3x4 to 3x14	60d common	30	25	20	.....	.....

I. Used square edge, as platforms, floors, sheathing, or shiplap.

II. When used D. & M., blind nailed, only ½ quantity named required.

TABLE 3 (Cont.)
Wire Nails—Kinds and Quantities Required

Length, in inches	American Steel & Wire Division's STEEL WIRE GAUGE No.	Approx. No. to lbs.	Nailings	Sizes and Kinds of Material	Trade Names	Pounds per 1000 feet B. M. on center as follows: 12″	16″	20″	36″	48″
2½	11½	145	2	Siding, drop, 1 x 4	8d casing.	45	35	.....	.....	.....
2½	11½	145	2	Siding, drop, 1 x 6	8d casing.	30	25	.....	.....	.....
2½	11½	145	2	Siding, drop, 1 x 8	8d casing. or 7d	23	18	.....	.....	.....
2	13	309	1	Siding, bevel, ½ x 4	6d finish.. Siding	23	18	.....	.....	.....
2	13	309	1	Siding, bevel, ½ x 6	6d finish.. Nails	15	13	.....	.....	.....
2	13	309	1	Siding, bevel, ½ x 8	6d finish..	12	10	.....	.....	.....
				Casing, per opening	6d and 8d casing	About ½ lb. per side.				
1¼	14	568	12″ o.c.	Flooring, ⅜ x 2	3d brads	About 10 lbs. per 1000 square feet.				
1⅛	15	778	16″ o.c.	Lath, 48″	3d sterilized blued lath	6 lbs. per 1000 pieces.				
⅞	12	469	2″ o.c.	Ready roofing	Barbed roofing	¾ of a lb. to the square.				
⅞	12	469	1″ o.c.	Ready roofing	Barbed roofing	1½ lbs. to the square.				
⅞	11	180	2″ o.c.	Ready roofing (7/16 heads)	Galvanized large head barbed roofing	1½ lbs. to the square.				
⅞	11	180	1″ o.c.	Ready roofing (7/16 heads)	Galvanized large head barbed roofing	3 lbs. to the square.				
1¼	13	429	.....	Shingles†	3d shingle	4½ lbs.; about 2 nails to each 4 inches.				
1½	12	274	.....	Shingles	4d shingle	7½ lbs.; about 2 nails to each 4 inches.				
⅞	11	180	4	Shingles	Galvanized large head barbed roofing	12 lbs., 4 nails to shingle.				
⅞	12	469	4	Shingles	Barbed roofing	4½ lbs., 4 nails to shingle.				
1	16	1150	2″ o.c.	Wall board, around entire edge	Plaster board nails flat head	5 lbs., per 1,000 square feet.				
1	15½	1010	3″ o.c.	Wall board, intermediate nailings	2d	2½ lbs., per 1,000 square feet.				

†Wood shingles vary in width; asphalt are usually 8 inches wide. Regardless of width 1000 shingles are the equivalent of 1000 pieces 4 inches wide.

TABLE 4
Approximate Number of Nails per Pound

American Steel & Wire Division's STEEL WIRE GAUGE No.	LENGTH												
	3/16	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
3/8	.....	.....	.....	.....	.....	.....	.....	29	26	23	20	17	15
5/16	.....	.....	.....	.....	.....	.....	.....	43	38	34	29	25	22
1	.....	.....	.....	.....	.....	.....	.....	47	44	40	34	29	26
2	.....	.....	.....	.....	.....	.....	.....	60	54	48	41	35	31
3	.....	.....	.....	.....	.....	.....	.....	67	60	55	47	41	36
4	.....	.....	.....	.....	.....	.....	.....	81	74	66	55	48	41
5	.....	.....	.....	.....	.....	.....	.....	90	81	74	61	52	45
6	.....	.....	.....	213	174	149	128	113	101	91	76	65	58
7	.....	.....	.....	250	205	174	148	132	120	110	92	78	70
8	.....	.....	.....	272	238	198	174	153	139	126	106	93	82
9	.....	.....	.....	348	286	238	213	185	170	152	128	112	99
10	.....	.....	.....	469	373	320	277	242	216	196	165	142	124
11	.....	.....	.....	510	417	366	323	285	254	233	200	171	149
12	.....	.....	.....	740	603	511	442	405	351	327	268	229	204
13	.....	.....	1356	1017	802	688	590	508	458	412	348	297	260
14	.....	2293	1664	1290	1037	863	806	667	610	536	459	406	350
15	.....	2899	2213	1619	1316	1132	971	869	787	694	578	501	437
16	.....	3932	2720	2142	1708	1414	1229	1099	973	872	739	635	553
17	.....	5316	3890	2700	2306	1904	1581	1409	1253	1139	956	831	746
18	.....	7520	5072	3824	3130	2608	2248	1976	1760	1590	1338	1150	996
19	.....	9920	6860	5075	4132	3508	2816	2556	2284	2096	1772	1590	1390
20	18620	14050	9432	7164	5686	4795	4230	3596	3225	2893	2412	2070	1810
21	23260	17252	12000	8920	7232	6052	5272	4576	4020	3640	3040	2665	2310
22	28528	21508	14676	11776	9276	7672	.....	.....	.....	.....	.....	.....	.....
23	35864	27039	18026	13519	10815	9013	.....	.....	.....	.....	.....	.....	.....
24	44936	34018	22678	17008	13607	11339	.....	.....	.....	.....	.....	.....	.....
25	57357	43243	28828	21622	17297	14414	.....	.....	.....	.....	.....	.....	.....

These approximate numbers are an Average only, and the figures given may be varied either way, by changes in the dimensions of the heads or points. Brads and no-head nails will run more to the pound than table shows, and large or thick-headed nails will run less.

TABLE 4 (Cont.)

Approximate Number of Nails per Pound

American Steel & Wire Division's STEEL WIRE GAUGE No.	LENGTH														
	2¼	2½	2¾	3	3½	4	4½	5	6	7	8	9	10	11	12
3/8	15	12	11	11	8.9	7.9	7.1	6.4	5.2	4.5	4.0	3.4	3.2	2.9	2.7
5/16	20	18	16	15	13	11	10	9.0	7.6	6.5	5.7	5.0	4.5	4.1	3.8
1	23	21	20	18	16	14	12	11	9.3	8.0	7.0	6.3	5.7	5.2	4.7
2	28	25	23	21	18	16	14	13	11	9.3	8.1	7.2	6.6	6.1	5.6
3	32	29	27	25	21	18	16	15	12	11	9.4	8.3	7.6	7.1	6.6
4	37	34	31	29	25	22	20	18	15	13	11	9.8	8.9	8.1	7.5
5	41	38	35	32	28	24	22	21	18	16	14	12	12	11	9.6
6	52	47	43	39	34	29	26	24	20	18	16	15	13	11	11
7	61	55	53	51	40	35	31	28	24	19	18	16	14	13	12
8	74	66	61	56	48	42	38	34	28	24	21	19	17	15	14
9	87	79	71	67	58	50	45	41	34	29	25	23	21	19	17
10	111	100	91	84	71	62	55	49	42	36	31	27	25	23	21
11	136	122	111	103	87	77	69	61	52	44	39	35	31	29	26
12	182	161	149	137	118	103	95	87	71	63	56	50	45	40	36
13	232	209	190	175	153	138	123	110	93	.....	.....	.....	.....	.....	.....
14	312	278	256	233	201	176	157	140	117	.....	.....	.....	.....	.....	.....
15	390	351	317	290	246	220	196	177	145	.....	.....	.....	.....	.....	.....
16	496	452	410	370	318	277	248	226	.....	.....	.....	.....	.....	.....	.....
17	666	590	532	486	418	360	322	295	.....	.....	.....	.....	.....	.....	.....
18	890	820	740	680	585	507	448	412	.....	.....	.....	.....	.....	.....	.....
19	1205	1060	970	895	800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	1620	1450	1315	1215	1035	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	2020	1830	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

These approximate numbers are an Average only, and the figures given may be varied either way, by changes in the dimensions of the heads or points. Brads and no-head nails will run more to the pound than table shows, and large or thick-headed nails will run less.

TABLE 5

Safe Uniformly Distributed Long-Time Loads for Structural Grade Beams Having an Allowable Unit Bending Stress (f) of 1800 psi.

SIZE						SIZE				
1x4	**1x6**	**1x7**	**1x8**	**1x9**	SPAN IN FT.	**1x10**	**1x12**	**1x14**	**1x15**	**1x16**
SAFE LOAD POUNDS						SAFE LOAD POUNDS				
533	1200	1633	2133	2700	**6**	3333	4800	6533	7500	8533
400	900	1225	1600	2025	**8**	2500	3600	4900	5633	6400
320	720	980	1280	1620	**10**	2000	2880	3920	4500	5120
267	600	816	1066	1350	**12**	1666	2400	3266	3750	4266
228	514	700	914	1157	**14**	1428	2056	2800	3214	3656
213	480	653	853	1080	**15**	1333	1920	2613	3000	3412
200	450	612	800	1012	**16**	1250	1800	2450	2816	3200
188	423	576	753	953	**17**	1176	1694	2306	2653	3012
178	400	544	711	900	**18**	1111	1600	2177	2500	2844
160	360	490	640	810	**20**	1000	1440	1960	2250	2560
145	327	445	582	736	**22**	909	1309	1782	2045	2327
139	313	426	556	704	**23**	869	1252	1704	1956	2226
133	300	408	533	675	**24**	833	1200	1633	1875	2133
128	288	392	512	648	**25**	800	1152	1568	1800	2048
123	277	377	492	623	**26**	769	1107	1507	1730	1969
119	267	363	474	600	**27**	740	1066	1451	1666	1896
114	257	350	457	578	**28**	714	1028	1400	1607	1828
107	240	326	426	540	**30**	667	960	1306	1500	1706
100	225	306	400	506	**32**	625	900	1225	1406	1600
			376	476	**34**	588	847	1153	1323	1506
			355	450	**36**	555	800	1088	1250	1422
			337	426	**38**	526	757	1031	1184	1347
			320	405	**40**	500	720	980	1125	1280

Safe Loads for Joists and Beams. What size joists are required in a hay bay 20 feet wide, 40 feet long and 12 feet high, the joists being supported at the ends only? The cubic contents = 20 x 40 x 12 or 9,600 cubic feet. At 512 cubic feet to the ton this bay will hold 18¾ tons or 37,500 pounds. Supposing the joists to be set 24″ on centers there would be 21 joists and each would have to carry 1-21 of 37,500 pounds or 1785 5-7 pounds. Referring to the table, the safe load for 1″ x 10″ beam with a 20′ span is 1000 lbs. This multiplied by 2, the joist thickness equals 2000 lbs., which is more than sufficient to carry the load.

If surfaced lumber is used, which is 1⅝″ thick x 9½″ deep, then the allowable load given in the table must be multiplied by a factor equal to the square of the actual depth over the square of the nominal depth. Safe load should be calculated as follows:

$$1000 \times 1\tfrac{5}{8} \times \frac{9.5 \times 9.5}{10 \times 10} = 1466 \text{ lbs.}$$

Since this is less than the required carrying capacity, either the spacing of the joists should be reduced proportionately or a deeper joist must be used. For example, let us try a 2 x 12 joist of surfaced lumber. Using the same formula:

$$1440 \times 1\tfrac{5}{8} \times \frac{11\tfrac{1}{2} \times 11\tfrac{1}{2}}{12 \times 12} = 2149 \text{ lbs.}$$

This gives us a safe carrying capacity.

Economy. It also indicates the economical sizes to give best results. For example, the safe load for a 4 x 4 16 is 800 pounds (4 x 200) while the safe load for a 2 x 6 is 900 pounds (2 x 450), showing that while the 2 x 6 contains much less material, yet when used on edge it is ⅛ stronger than the 4 x 4.

Safe Long-time Uniformly Distributed Loads for 1800-Lb. Structural Grade Lumber. Load values given are for lumber set on edge (wide dimension vertical) and supported at both ends. Multiply values given by actual thickness of joists or beams used.

The safe loads computed are for commercial structural grades of lumber and are based on full sawn stock. Where lumber of lower grade is used these loads should be reduced, using 89% of the loads for a 1600-lb. structural grade lumber, 78% for a 1400 lb. grade, 66-2/3% for a 1200-lb. grade, and 55½% for a 1000 lb. grade.

1. When the load is concentrated midway' between the supports, take only half of above load.
2. For beams fixed at one end the other unsupported and the load uniformly distributed takes one-fourth of above loads, if the load is concentrated on the unsupported end, then take only one-eighth of above.
3. In the above, the safe load includes the weight of the joists, which must be deducted to get the net or superimposed safe load.

TABLE 6

Allowable Unit Stresses—Stress-Grade Lumber

[The allowable unit stresses below are for normal loading conditions]

1 Species and commercial grade [1]	2 Rules under which graded	Allowable unit stresses in pounds per square inch: 3 Extreme fiber in bending "f" and tension parallel to grain "ft" [3]	4 Compression parallel to grain "c"	5 Modulus of elasticity "E"
ASH, WHITE				
2150 f Grade..... J.&P.....		2,150	1,700	1,650,000
1900 f Grade..... J.&P.–B.&S...		1,900	1,500	1,650,000
1700 f Grade..... J.&P.–B.&S...		1,700	1,325	1,650,000
1450 f Grade..... J.&P.–B.&S...	N.H.L.A.	1,450	1,150	1,650,000
1300 f Grade..... B.&S.....		1,300	1,050	1,650,000
1450 c Grade..... P.&T.....		.....	1,450	1,650,000
1200 c Grade..... P.&T.....		.....	1,200	1,650,000
1075 c Grade..... P.&T.....		.....	1,075	1,650,000
BEECH				
BIRCH				
2150 f Grade..... J.&P.....		2,150	1,750	1,760,000
1900 f Grade..... J.&P.–B.&S...		1,900	1,525	1,760,000
1700 f Grade..... J.&P.–B.&S...		1,700	1,350	1,760,000
1450 f Grade..... J.&P.–B.&S...	N.H.L.A.	1,450	1,150	1,760,000
1550 c Grade..... P.&T.....		.....	1,550	1,760,000
1450 c Grade..... P.&T.....		.....	1,450	1,760,000
1200 c Grade..... P.&T.....		.....	1,200	1,760,000
CHESTNUT				
1450 f Grade..... J.&P.....		1,450	1,200	1,100,000
1200 f Grade..... J.&P.–B.&S...	N.H.L.A.	1,200	950	1,100,000
1075 c Grade..... P.&T.....		.....	1,075	1,100,000
CYPRESS, SOUTHERN, COAST TYPE (Tidewater Red)				
1700 f Grade..... J.&P.–B.&S...		1,700	1,425	1,320,000
1300 f Grade..... J.&P.–B.&S...	S.C.M.A.	1,300	1,125	1,320,000
1450 c Grade..... P.&T.....		.....	1,450	1,320,000
1200 c Grade..... P.&T.....		.....	1,200	1,320,000
CYPRESS, SOUTHERN, INLAND TYPE				
1700 f Grade..... J.&P.–B.&S...		1,700	1,425	1,320,000
1300 f Grade..... J.&P.–B.&S...	N.H.L.A.	1,300	1,125	1,320,000
1450 c Grade..... P.&T.....		.....	1,450	1,320,000
1200 c Grade..... P.&T.....		.....	1,200	1,320,000
DOUGLAS FIR, COAST REGION				
Dense Select Structural [2]..... L.F.....		2,050	1,500	1,760,000
Select Structural..... L.F.....	W.C.L.I.B.	1,900	1,400	1,760,000
1500 f Industrial..... L.F.....		1,500	1,200	1,760,000
1200 f Industrial..... L.F.....		1,200	1,000	1,760,000

J.&P. = Joists & Planks
B.&S. = Beams & Stringers
P.&T. = Posts & Timbers
L.F. = Light Framing

N.H.L.A. = National Hardwood Lumber Association
S.C.M.A. = Southern Cypress Manufacturers' Association
W.C.L.I.B. = West Coast Lumber Inspection Bureau

TABLE 6 (Cont.)

Allowable Unit Stresses—Stress-Grade Lumber

[The allowable unit stresses below are for normal loading conditions]

1 Species and commercial grade [1]	2 Rules under which graded	Allowable unit stresses in pounds per square inch		
		3 Extreme fiber in bending "f" and tension parallel to grain "t" [3]	4 Compression parallel to grain "c"	5 Modulus of elasticity "E"
DOUGLAS FIR, COAST REGION—Continued				
Dense Select Structural[2]..... J.&P.....		2,050	1,650	1,760,000
Select Structural..... J.&P.....		1,900	1,500	1,760,000
Dense Construction[2]..... J.&P.....		1,750	1,400	1,760,000
Construction..... J.&P.....		1,500	1,200	1,760,000
Standard..... J.&P.....	W.C.L.I.B.	1,200	1,000	[10]1,760,000
Dense Select Structural[2]..... B.&S.....		2,050	1,500	1,760,000
Select Structural..... B.&S.....		1,900	1,400	1,760,000
Dense Construction[2]..... B.&S.....		1,750	1,200	1,760,000
Construction..... B.&S.....		1,500	1,000	1,760,000
Dense Select Structural[2]..... P.&T.....		1,900	1,650	1,760,000
Select Structural..... P.&T.....		1,750	1,500	1,760,000
Dense Construction[2]..... P.&T.....		1,500	1,400	1,760,000
Construction..... P.&T.....		1,200	1,200	1,760,000
DOUGLAS FIR, INLAND REGION				
Select Structural [2]..... J.&P.[4].....		2,150	1,750	1,760,000
Structural..... J.&P.[4].....		1,900	1,400	1,760,000
Common Structural..... J.&P.[4].....	W.P.A.	1,450	1,250	1,760,000
Select Structural [2]..... P.&T.....		.....	1,750	1,760,000
Structural..... P.&T.....		.....	1,400	1,760,000
Common Structural..... P.&T.....		.....	1,250	1,760.000
ELM ROCK				
2150 f Grade..... J.&P.....		2,150	1,750	1,430,000
1900 f Grade..... J.&P.–B.&S...		1,900	1,525	1,430,000
1700 f Grade..... J.&P.–B.&S...		1,700	1,350	1,430,000
1450 f Grade..... J &P.–B.&S...	N.H.L.A.	1,450	1,150	1,430,000
1550 c Grade..... P.&T.....		.....	1,550	1,430,000
1450 c Grade..... P.&T.....		.....	1,450	1,430,000
1200 c Grade..... P.&T.....		.....	1,200	1,430,000
ELM, SOFT GUM, BLACK and RED TUPELO				
1700 f Grade..... J.&P.....		1,700	1,225	1,320,000
1450 f Grade..... J.&P.–B.&S...	N.H.L.A.	1,450	1,050	1,320,000
1200 f Grade..... J.&P.–B.&S...		1,200	875	1,320,000
1075 c Grade..... P.&T.....		.....	1,075	1,320,000

J.&P. = Joists & Planks
B.&S. = Beams & Stringers
P.&T. = Posts & Timbers
L.F. = Light Framing

W.C.L.I.B. = West Coast Lumber Inspection Bureau
W.P.A. = Western Pine Association
N.H.L.A. = National Hardwood Lumber Association

TABLE 6 (Cont.)

Allowable Unit Stresses—Stress-Grade Lumber

[The allowable unit stresses below are for normal loading conditions]

1 Species and commercial grade [1]	2 Rules under which graded	Allowable unit stresses in pounds per square inch		5 Modulus of elasticity "E"
		3 Extreme fiber in bending "f" and tension parallel to grain "t" [3]	4 Compression parallel to grain "c"	
HEMLOCK, EASTERN				
Select Structural ..... J.&P.[4]–B.&S.[4]		1,300	850	1,210,000
Prime Structural ..... J.&P.[14-4]		1,200	775	1,210,000
Common Structural ..... J.&P.[14-4]	N.H.&H.M.A.	1,100	650	1,210,000
Utility Structural ..... J.&P.[14-4]		950	600	1,210,000
Select Structural ..... P.&T.		.....	850	1,210,000
HEMLOCK, WEST COAST				
Select Structural ..... L.F.		1,600	1,100	1,540,000
1500 f Industrial ..... L.F.		1,500	1,000	1,540,000
1200 f Industrial ..... L.F.		1,200	900	1,540,000
Select Structural ..... J.&P.	W.C.L.I.B.	1,600	1,200	1,500,000
Construction ..... J.&P.		1,500	1,100	1,540,000
Standard ..... J.&P.		1,200	1,000	1,540,000
Construction ..... B.&S.		1,500	1,000	1,540,000
Construction ..... P.&T.		1,200	1,100	1,540,000
HICKORY				
PECAN				
2150 f Grade ..... J.&P.–B.&S...		2,150	1,725	1,980,000
1900 f Grade ..... J.&P.–B.&S...		1,900	1,550	1,980,000
1700 f Grade ..... J.&P.–B.&S...	N.H.L.A.	1,700	1,350	1,980,000
1550 c Grade ..... P.&T.		.....	1,550	1,980,000
1450 c Grade ..... P.&T.		.....	1,450	1,980,000
1325 c Grade ..... P.&T.		.....	1,325	1,980,000
LARCH				
Select Structural [2] ..... J.&P.[4]		2,150	1,750	1,650,000
Structural ..... J.&P.[4]		1,900	1,450	1,650,000
Common Structural ..... J.&P.[4]	W.P.A.	1,450	1,325	1,650,000
Select Structural [2] ..... P.&T.		.....	1,750	1,650,000
Structural ..... P.&T.		.....	1,450	1,650,000
Common Structural ..... P.&T.		.....	1,325	1,650,000
MAPLE, HARD				
2150 f Grade ..... J.&P.		2,150	1,750	1,760,000
1900 f Grade ..... J.&P.–B.&S...		1,900	1,525	1,760,000
1700 f Grade ..... J.&P.–B.&S...	N.H.L.A.	1,700	1,350	1,760,000
1450 f Grade ..... J.&P.–B.&S...		1,450	1,150	1,760,000
1550 c Grade ..... P.&T.		.....	1,550	1,760,000
1450 c Grade ..... P.&T.		.....	1,450	1,760,000
1200 c Grade ..... P.&T.		.....	1,200	1,760,000

J.&P. = Joists & Planks
B.&S. = Beams & Stringers
P.&T. = Posts & Timbers
L.F. = Light Framing

N.H.&H.M.A. = Northern Hemlock and Hardwood Manufacturers' Association
W.C.L.I.B. = West Coast Lumber Inspection Bureau
W.P.A. = Western Pine Association
N.H.L.A. = National Hardwood Lumber Association

TABLE 6 (Cont.)

Allowable Unit Stresses—Stress-Grade Lumber

[The allowable unit stresses below are for normal loading conditions]

1 Species and commercial grade [1]	2 Rules under which graded	Allowable unit stresses in pounds per square inch		5
		3 Extreme fiber in bending "f" and tension parallel to grain "ft" [3]	4 Compression parallel to grain "c"	Modulus of elasticity "E"
PINE, SOUTHERN [15]				
Dense Structural 86 KD [2-17-18]. 2" thick only		3,000	2,250	1,760,000
Dense Structural 72 KD [2-17-18]. "		2,500	1,950	1,760,000
Dense Structural 65 KD [2-17-18]. "		2,250	1,800	1,760,000
Dense Structural 58 KD [2-17-18]. "		2,050	1,650	1,760,000
No. 1 Dense KD [2-17-18]..... "		2,050	1,750	1,760,000
No. 1 KD [17]..... "		1,750	1,500	1,760,000
No. 2 Dense KD [2-17-18]..... "		1,750	1,300	1,760,000
No. 2 KD [17]..... "		1,500	1,100	1,760,000
Dense Structural 86 [2-18]..... 2" thick only		2,900	2,200	1,760,000
Dense Structural 72 [2-18]..... "		2,350	1,800	1,760,000
Dense Structural 65 [2-18]..... "		2,050	1,600	1,760,000
Dense Structural 58 [2-18]..... "		1,750	1,450	1,760,000
No. 1 Dense [2-18]..... "		1,750	1,550	1,760,000
No. 1..... "		1,500	1,350	1,760,000
No. 2 Dense [2-18]..... "		1,400	1,050	1,760,000
No. 2..... "		1,200	900	1,760,000
Dense Structural 86 [2-18]..... 3" & 4" thick	S.P.I.B.	2,900	2,200	1,760,000
Dense Structural 72 [2-18]..... "		2,350	1,800	1,760,000
Dense Structural 65 [2-18]..... "		2,050	1,600	1,760,000
Dense Structural 58 [2-18]..... "		1,750	1,450	1,760,000
No. 1 Dense SR [2-18]..... "		1,750	1,750	1,760,000
No. 1 SR..... "		1,500	1,500	1,760,000
No. 2 Dense SR [2-18]..... "		1,400	1,050	1,760,000
No. 2 SR..... "		1,200	900	1,760,000
Dense Structural 86 [2-18]..... 5" thick & up		[16]2,400	1,800	1,760,000
Dense Structural 72 [2-18]..... "		[16]2,000	1,550	1,760,000
Dense Structural 65 [2-18]..... "		[16]1,800	1,400	1,760,000
Dense Structural 58 [2-18]..... "		[16]1,600	1,300	1,760,000
No. 1 Dense SR [2-18]..... "		[16]1,600	1,500	1,760,000
No. 1 SR..... "		[16]1,400	1,300	1,760,000
No. 2 Dense SR [2-18]..... "		[16]1,400	1,050	1,760,000
No. 2 SR..... "		[16]1,200	900	1,760,000
Industrial 86 KD [17]..... 1", 1¼" and		2,600	1,950	1,760,000
Industrial 72 KD [17]..... 1½" thick		2,200	1,650	1,760,000
Industrial 65 KD [17]..... "		2,000	1,550	1,760,000
Industrial 58 KD [17]..... "		1,750	1,400	1,760,000
Industrial 50 KD [17]..... "		1,500	1,100	1,760,000

J.&P. = Joists & Planks
B.&S. = Beams & Stringers
P.&T. = Posts & Timbers
L.F. = Light Framing

S.P.I.B. = Southern Pine Inspection Bureau

TABLE 6 (Cont.)

Allowable Unit Stresses—Stress-Grade Lumber

[The allowable unit stresses below are for normal loading conditions]

1 Species and commercial grade [1]		2 Rules under which graded	Allowable unit stresses in pounds per square inch		5
			3 Extreme fiber in bending "f" and tension parallel to grain "ft" [3]	4 Compression parallel to grain "c"	Modulus of elasticity "E"
PINE SOUTHERN [15]—Continued					
Industrial 86	1", 1¼" and		2,500	1,900	1,760,000
Industrial 72	1½" thick		2,000	1,500	1,760,000
Industrial 65	"	S.P.I.B.	1,750	1,350	1,760,000
Industrial 58	"		1,500	1,250	1,760,000
Industrial 50	"		1,200	900	1,760,000
OAK, RED and WHITE					
2150 f Grade	J.&P.		2,150	1,550	1,650,000
1900 f Grade	J.&P.–B.&S.		1,900	1,375	1,650,000
1700 f Grade	J.&P.–B.&S.		1,700	1,200	1,650,000
1450 f Grade	J.&P.–B.&S.	N.H.L.A.	1,450	1,050	1,650,000
1300 f Grade	B.&S.		1,300	950	1,650,000
1325 c Grade	P.&T.		.....	1,325	1,650,000
1200 c Grade	P.&T.		.....	1,200	1,650,000
1075 c Grade	P.&T.		.....	1,075	1,650,000
PINE, NORWAY					
Prime Structural	J.&P.[14-4]		1,200	900	1,320,000
Common Structural	J.&P.[14-4]	N.H.&H.M.A.	1,100	775	1,320,000
Utility Structural	J.&P.[14-4]		950	650	1,320,000
POPLAR, YELLOW					
1500 f Grade	J.&P.		1,500	1,200	1,210,000
1250 f Grade	J.&P.–B.&S.	N.H.L.A.	1,250	950	1,210,000
1075 c Grade	P.&T.		.....	1,075	1,210,000
REDWOOD					
Dense Structural [2]	J.&P.[4]-B.&S.[4]		1,700	1,450	1,320,000
Heart Structural	J.&P.[4]-B.&S.[4]	C.R.A.	1,300	1,100	1,320,000
Dense Structural [2]	P.&T.		.....	1,450	1,320,000
Heart Structural	P.&T.		.....	1,100	1,320,000
SPRUCE, EASTERN					
1450 f Structural Grade	J.&P.[4]		1,450	1,050	1,320,000
1300 f Structural Grade	J.&P.[4]	N.L.M.A.	1,300	975	1,320,000
1200 f Structural Grade	J.&P.[4]		1,200	900	1,320,000

J.&P. = Joists & Planks
B.&S. = Beams & Stringers
P.&T. = Posts & Timbers
L.F. = Light Framing

S.P.I.B. = Southern Pine Inspection Bureau
N.H.L.A. = National Hardwood Lumber Association
N.H.&H.M.A. = Northern Hemlock and Hardwood Manufacturers' Association
C.R.A. = California Redwood Association
N.L.M.A. = Northeastern Lumber Manufacturers' Association, Inc.

TABLE 6 — NOTES

[1] Abbreviations: (For description of classification of material, see par. 102-B) J&P = Joists and Planks; B&S = Beams and Stringers; P&T = Posts and Timbers; LF = Light Framing; KD = See Note 17; SR = Stress Rated.

[2] These grades meet the requirements for density.

[3] In tension members the slope of grain limitations applicable to the middle portion of the length of the joist and plank and beam and stringer grades used shall apply throughout the length of the piece.

[4] The allowable unit stresses for tension parallel to grain "t" and for compression parallel to grain "c" given for these Joist and Plank and Beam and Stringer grades are applicable when the following additional provisions are applied to the grades:

The sum of the sizes of all knots in any 6 inches of the length of the piece shall not exceed twice the maximum permissible size of knot. Two knots of maximum permissible size shall not be within the same 6 inches of length of any face.

[5] Value applies to pieces used as planks.

[6] Value applies to 2″ thick pieces of Select Structural grade used as joists.

[7] For 2″ thick pieces of Construction and Standard Grades used as joists:
H = 120 when length of split is approximately equal to ⅓ the width of piece
H = 100 when length of split is approximately equal to the width of piece
H = 70 when length of split is approximately equal to 1 ½ times width of piece

[8] For 3″ thick pieces of Select Structural, Construction and Standard grades used as joists:
H = 120 when length of split is approximately 2 ½″,
H = 80 when length of split is approximately 4 ½″, and
For 4″ thick pieces of Select Structural, Construction and Standard grades used as joists:
H = 120 when length of split is approximately 3″
H = 80 when length of split is approximately 6″

[9] For Beams and Stringers and for Posts and Timbers:
H = 120 when length of split is equal to ⅓ the nominal narrow face dimension
H = 100 when length of split is equal to the nominal narrow face dimension
H = 80 when length of split is equal to 1 ½ times the nominal narrow face dimension
NOTE: Values for lengths of split other than those given in Notes 7, 8 and 9 are proportionate.

[10] Pieces of less than medium grain, when included in the grade of "STANDARD" may be considered as having a modulus of elasticity "E" of 1,320,000.

[11] For 2″ thick pieces of Construction and Standard Grades used as joists:
H = 100 when length of split is approximately equal to ⅓ the width of piece
H = 80 when length of split is approximately equal to the width of piece
H = 60 when length of split is approximately equal to 1 ½ times width of piece

[12] For 3″ thick pieces of Select Structural, Construction and Standard grades used as joists:
H = 100 when length of split is approximately 2 ½″,
H = 70 when length of split is approximately 4 ½″, and
For 4″ thick pieces of Select Structural, Construction and Standard grade used as joists:
H = 100 when length of split is approximately 3″
H = 70 when length of split is approximately 6″

[13] For Beams and Stringers and for Posts and Timbers:
H = 100 when length of split is equal to ¾ the nominal narrow face dimension
H = 90 when length of split is equal to the nominal narrow face dimension
H = 70 when length of split is equal to 1 ½ times the nominal narrow face dimension
NOTE: Values for lengths of splits other than those given in Notes 11, 12, and 13 are proportionate.

[14] These grades applicable to 2″ thickness only.

[15] All stress-grades under the 1956 Grading Rules are all-purpose grades and apply to all sizes. Pieces so graded may be cut to shorter lengths without impairment of the stress rating of the shorter pieces.

Grade restrictions provided by the 1956 Grading Rules apply to the entire length of the piece, and each piece is suitable for use in continuous spans, over double spans or under concentrated loads without regrading for special shear or other special stress requirements.

The following variations apply to the provisions of paragraph 202-B for lumber in service under wet conditions or where the moisture content is at or above fiber saturation point, as when continuously submerged, (a) the allowable unit stresses in bending, tension parallel to grain and horizontal shear shall be limited in all thicknesses to the stresses indicated for thicknesses of 5″ and up; (b) the allowable unit stresses for compression parallel to grain shall be limited to the stresses indicated for thicknesses of 5″ and up reduced by 10 %; (c) the allowable unit stresses for compression perpendicular to grain shall be reduced one-third; and (d) the values for modulus of elasticity shall be reduced one-eleventh.

[16] These stresses apply for loading either on narrow face or on wide face, which is an exception to paragraphs 102-B-1 and 205-B.

[17] KD = Kiln dried in accordance with the provisions of paragraphs 219 and 220 of the 1956 Grading Rules.

[18] Longleaf may be specified by substituting "Longleaf" for "Dense" in the grade name, and when so specified the same allowable stresses shall apply.

TABLE 7
Safe Loads for Dressed (S4S) Timber Columns Standing Plumb and Supported at Ends Only[1]

Nominal Size of Post (Inch)	Length of Post (Feet)							
	8	10	12	14	16	18	20	22
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
4 x 4	9,264	5,939	4,126	3,035	[2]	[2]	[2]	[2]
5 x 5	22,275	14,059	9,789	7,206	5,498	4,351	[2]	[2]
6 x 6	33,275	31,521	21,810	16,093	12,282	9,680	7,865	6,504
8 x 8	61,875	61,875	61,875	55,463	42,469	33,581	27,169	22,500
10 x 10	99,275	99,275	99,275	99,275	99,275	86,730	69,763	57,850
12 x 12	145,475	145,475	145,475	145,475	145,475	145,475	145,475	123,786
14 x 14	200,475	200,475	200,475	200,475	200,475	200,475	200,475	200,475
16 x 16	264,275	264,275	264,275	264,275	264,275	264,275	264,275	264,275
18 x 18	336,875	336,875	336,875	336,875	336,875	336,875	336,875	336,875
20 x 20	418,275	418,275	418,275	418,275	418,275	418,275	418,275	418,275

[1] These values apply only to stress graded or structural lumber having a unit compressive stress of 1100 psi and a modulus of elasticity = 1,650,000 psi. They apply to dressed lumber and were calculated from actual rather than nominal dimensions.

[2] The ratio of length to thickness is greater than 50:1 for these columns and they cannot, therefore, be used supported at their ends only.

TABLE 8
Depreciation

FRAME				The Constituent Parts of Buildings	BRICK, Shingle Roofs			
Stores		Dwellings			Dwellings		Stores	
Average Duration	Depreciation per Year	Average Duration	Depreciation per Year		Average Duration	Depreciation per Year	Average Duration	Depreciation per Year
Years	Percent	Years	Percent		Years	Percent	Years	Percent
30	3⅓	40	2½	Base	40	2½	30	3½
.....	.....	.....	.....	Brick	75	1⅛	66	1½
30	3⅓	40	2½	Cornice	40	2½	40	2½
40	2½	50	2	Dimension lumber	75	1⅓	66	1⅓
25	4	30	3⅓	Doors and trim	30	3⅓	30	3⅓
13	8	20	5	Floors	20	5	13	8
13	8	20	5	Hardware	13	8	20	5
30	3⅓	30	3⅓	Inside blinds	30	3⅓	30	3⅓
16	6	16	6	Outside blinds	16	6	16	6
5	20	7	14	Paint, inside	7	14	6	16
5	20	5	20	Paint, outside	7	14	6	16
16	6	20	5	Plaster	30	3⅓	30	3⅓
20	5	20	5	Porches	20	5	20	5
16	6	16	6	Shingles of wood	16	6	16	6
40	2½	50	2	Sheathing	50	2	50	2
30	3⅓	30	3⅓	Siding	.....	.....	.....	.....
25	4	25	4	Sills and first floor joists	40	2½	30	3⅓
20	5	30	3⅓	Stairs	30	3⅓	20	5
25	4	30	3⅓	Windows	30	3⅓	30	3⅓

The facts in the above table were compiled by Mr. A W. Spaulding for the Fire Underwriters' Association of the Northwest. Mr. Spaulding's investigation covered twenty-seven cities and towns in eleven western states, and it is believed that the table is as accurate as it is possible to produce. This Actuary table will enable lumbermen to pass upon the value of the constituent parts of any kind of building.

TABLE 9
Rafters and Gables

WIDTH OF BUILDING	FOURTH PITCH				Area of Two Gables	THIRD PITCH				Area of Two Gables	HALF PITCH				Area of Two Gables
	Length of Rafter		Rise From Plate to Comb			Length of Rafter		Rise From Plate to Comb			Length of Rafter		Rise From Plate to Comb		
	ft.	in.	ft.	in.		ft.	in.	ft.	in.		ft.	in.	ft.	in.	
6	3	4	1	6	9	3	7	2	0	12	4	3	3	0	18
7	3	11	1	9	12	4	0	2	4	16	5	0	3	6	25
8	4	6	2	0	16	4	10	2	8	21	5	8	4	0	32
9	5	0	2	3	20	5	5	3	0	27	6	5	4	6	41
10	5	7	2	6	25	6	0	3	4	33	7	1	5	0	50
12	6	8	3	0	36	7	2	4	0	48	8	6	6	0	72
14	7	10	3	6	49	8	5	4	8	65	9	11	7	0	98
16	9	0	4	0	64	9	7	5	4	85	11	4	8	0	128
18	10	1	4	6	81	10	10	6	0	108	12	9	9	0	162
20	11	2	5	0	100	12	0	6	8	133	14	2	10	0	200
22	12	4	5	6	121	13	2	7	4	161	15	7	11	0	242
24	13	5	6	0	144	14	5	8	0	192	17	0	12	0	288
26	14	6	6	6	169	15	7	8	8	225	18	6	13	0	338
28	15	8	7	0	196	16	10	9	4	261	19	11	14	0	392
30	16	9	7	6	225	18	0	10	0	300	21	4	15	0	450
32	17	11	8	0	256	19	2	10	8	341	22	9	16	0	512

To the lengths of rafters above given must be added the desired projection for cornice. Add also to make stock lengths.

For length of rafter on one-way roofs, take the rafter given for double the width thus: The rafter for a one-way roof on a building 10 feet wide, 4th pitch is that given for 20 feet wide or 11 feet, 2 inches.

In area of gable above given no allowance is made for waste or laps.

To verify above or obtain length of rafters for buildings of other widths than above given multiply the width of building by .559 for 4th pitch; by .6 for 3d pitch and by .71 for half pitch.

TABLE 10
Capacity, in Bushels, of Cribs or Bins, Each Eight Feet High in the Clear

WIDTH					LENGTH	WIDTH				
3	8	10	12	14		16	18	22	26	30
BUSHELS						BUSHELS				
77	206	257	309	360	**4**	411	463	566	669	771
96	257	321	386	450	**5**	514	579	707	836	964
116	309	386	463	540	**6**	617	694	849	1003	1157
135	360	450	540	630	**7**	720	810	990	1170	1350
154	411	514	617	720	**8**	823	926	1131	1337	1543
174	463	579	694	810	**9**	926	1041	1273	1504	1736
193	514	643	771	900	**10**	1029	1157	1414	1671	1928
231	617	771	926	1080	**12**	1234	1388	1697	2006	2314
270	720	890	1080	1260	**14**	1440	1620	1980	2340	2700
309	823	1029	1234	1440	**16**	1646	1851	2263	2674	3086
347	926	1157	1388	1620	**18**	1851	2083	2546	3008	3471
386	1029	1286	1543	1800	**20**	2057	2314	2828	3343	3857
424	1131	1414	1697	1980	**22**	2263	2546	3111	3677	4243
463	1233	1543	1851	2160	**24**	2468	2777	3394	4011	4628
501	1337	1671	2006	2340	**26**	2674	3008	3677	4345	5014
540	1440	1800	2160	2520	**28**	2880	3240	3960	4680	5400
579	1543	1928	2314	2700	**30**	3086	3471	4243	5014	5785
617	1646	2057	2468	2880	**32**	3291	3703	4525	5348	6171

How large a bin shall I build to hold 800 bushels? is a very common question. To answer this and similar ones instantly is the object of above table, thus: How long a bin 8 feet wide and 8 feet high is required to hold 800 bushels of oats? Run down the 8-foot column until 823, the nearest amount to 800 bushels, is reached, and opposite, in the center column headed length, is 16, the length required.

For ear corn divide above quantities by 2; i.e., a bin 8x8x16 will hold only 411 bushels ear corn.

For bins 10 feet high add ¼ to above.

TABLE 11
Area of Openings

WIDE				HIGH	WIDE			
22″ 1′10″	24″ 2′0″	26″ 2′2″	28″ 2′4″		30″ 2′6″	32″ 2′8″	34″ 2′10″	36″ 3′0″
SQUARE FEET					SQUARE FEET			
3.67	4.00	4.33	4.67	24″ = 2′ 0″	5.00	5.33	5.67	6.00
3.82	4.17	4.51	4.86	25″ = 2′ 1″	5.21	5.56	5.90	6.25
3.97	4.33	4.69	5.06	26″ = 2′ 2″	5.42	5.78	6.14	6.50
4.12	4.50	4.87	5.25	27″ = 2′ 3″	5.62	6.00	6.37	6.75
4.28	4.67	5.05	5.44	28″ = 2′ 4″	5.83	6.22	6.61	7.00
4.43	4.83	5.24	5.64	29″ = 2′ 5″	6.04	6.44	6.85	7.25
4.58	5.00	5.42	5.83	30″ = 2′ 6″	6.25	6.67	7.08	7.50
4.74	5.17	5.60	6.03	31″ = 2′ 7″	6.46	6.89	7.32	7.75
4.89	5.33	5.78	6.22	32′ = 2′ 8″	6.67	7.11	7.55	8.00
5.04	5.50	5.96	6.42	33″ = 2′ 9″	6.87	7.33	7.79	8.25
5.19	5.67	6.14	6.61	34″ = 2′10″	7.08	7.55	8.03	8.50
5.35	5.83	6.32	6.80	35″ = 2′11″	7.29	7.78	8.26	8.75
5.50	6.00	6.50	7.00	36″ = 3′ 0″	7.50	8.00	8.50	9.00
5.65	6.17	6.68	7.19	37″ = 3′ 1″	7.71	8.22	8.73	9.25
5.80	6.33	6.86	7.39	38″ = 3′ 2″	7.91	8.44	8.97	9.50
5.96	6.50	7.04	7.58	39″ = 3′ 3″	8.12	8.66	9.21	9.75
6.11	6.67	7.22	7.78	40″ = 3′ 4″	8.33	8.89	9.44	10.00
6.26	6.83	7.40	7.97	41″ = 3′ 5″	8.54	9.11	9.68	10.25
6.42	7.00	7.58	8.16	42″ = 3′ 6″	8.75	9.33	9.91	10.50
6.57	7.17	7.76	8.36	43″ = 3′ 7″	8.96	9.55	10.15	10.75
6.72	7.33	7.94	8.55	44″ = 3′ 8″	9.16	9.77	10.39	11.00
6.87	7.50	8.12	8.75	45″ = 3′ 9″	9.37	10.00	10.62	11.25
7.03	7.67	8.30	8.94	46″ = 3′10″	9.58	10.22	10.86	11.50
7.18	7.83	8.40	9.14	47″ = 3′11″	9.79	10.44	11.09	11.75
7.33	8.00	8.66	9.33	48″ = 4′ 0″	10.00	10.66	11.33	12.00

Explanation—For the square feet in an opening 36 by 58 inches read in the 36-inch column opposite 58 in the center 14.50.

TABLE 11 (Cont.)

Area of Openings

WIDE				HIGH	WIDE			
22″ 1′10″	24″ 2′0″	26″ 2′2″	28″ 2′4″		30″ 2′6″	32″ 2′8″	34″ 2′10″	36″ 3′0″
SQUARE FEET					SQUARE FEET			
7.48	8.17	8.84	9.52	49″ = 4′ 1″	10.21	10.88	11.57	12.25
7.64	8.33	9.02	9.72	50″ = 4′ 2″	10.41	11.11	11.80	12.50
7.79	8.50	9.20	9.91	51″ = 4′ 3″	10.62	11.33	12.04	12.75
7.94	8.66	9.38	10.11	52″ = 4′ 4″	10.83	11.55	12.27	13.00
8.09	8.83	9.56	10.30	53″ = 4′ 5″	11.04	11.77	12.51	13.25
8.25	9.00	9.75	10.50	54″ = 4′ 6″	11.25	11.99	12.75	13.50
8.40	9.16	9.93	10.69	55″ = 4′ 7″	11.45	12.22	12.98	13.75
8.55	9.33	10.11	10.88	56″ = 4′ 8″	11.66	12.44	13.22	14.00
8.71	9.50	10.29	11.06	57″ = 4′ 9″	11.87	12.66	13.45	14.25
8.86	9.66	10.47	11.27	58″ = 4′10″	12.08	12.88	13.69	14.50
9.01	9.83	10.65	11.47	59″ = 4′11″	12.29	13.10	13.93	14.75
9.16	10.00	10.83	11.66	60″ = 5′ 0″	12.50	13.33	14.16	15.00
9.32	10.16	11.01	11.86	61″ = 5′ 1″	12.70	13.55	14.40	15.25
9.47	10.33	11.19	12.05	62″ = 5′ 2″	12.91	13.77	14.63	15.50
9.62	10.50	11.37	12.24	63″ = 5′ 3″	13.12	13.99	14.87	15.75
9.77	10.66	11.55	12.44	64″ = 5′ 4″	13.33	14.21	15.11	16.00
9.93	10.83	11.73	12.63	65″ = 5′ 5″	13.54	14.44	15.34	16.25
10.08	11.00	11.91	12.83	66″ = 5′ 6″	13.74	14.66	15.58	16.50
10.23	11.16	12.09	13.02	67″ = 5′ 7″	13.95	14.88	15.81	16.75
10.39	11.33	12.27	13.22	68″ = 5′ 8″	14.16	15.10	16.05	17.00
10.54	11.50	12.45	13.41	69″ = 5′ 9″	14.37	15.32	16.29	17.25
10.69	11.66	12.63	13.60	70″ = 5′10″	14.58	15.55	16.52	17.50
10.84	11.83	12.81	13.80	71″ = 5′11″	14.79	15.77	16.76	17.75
11.00	12.00	13.00	14.00	72″ = 6′ 0″	15.00	16.00	17.00	18.00

Explanation—For the square feet in an opening 36 by 58 inches read in the 36-inch column opposite 58 in the center 14.50.

TABLE 12
Square Feet in the Ceiling and Four Walls of a Room

7-Foot Ceilings

FEET WIDE							FEET WIDE					
3	4	5	6	7	8	Feet Long	9	10	11	12	13	14
AREA SQUARE FEET							AREA SQUARE FEET					
93	110	127	144	161	178	**3**	195	212	229	246	263	280
110	128	146	164	182	200	**4**	218	236	254	272	290	308
127	146	165	184	203	222	**5**	241	260	279	298	317	336
144	164	184	204	224	244	**6**	264	284	304	324	344	364
161	182	203	224	245	266	**7**	287	308	329	350	371	392
178	200	222	244	266	288	**8**	310	332	354	376	398	420
195	218	241	264	287	310	**9**	333	356	379	402	425	448
212	236	260	284	308	332	**10**	356	380	404	428	452	476
229	254	279	304	329	354	**11**	379	404	429	454	479	594
246	272	298	324	350	376	**12**	402	428	454	480	506	532
263	290	317	344	371	398	**13**	425	452	479	506	533	560
280	308	336	364	392	420	**14**	448	476	504	532	560	588
297	326	355	384	413	442	**15**	471	500	529	558	587	616
314	344	374	404	434	464	**16**	494	524	554	584	614	644
331	362	393	424	455	486	**17**	517	548	579	610	641	672
348	380	412	444	476	508	**18**	540	572	604	636	668	700
365	398	431	464	497	530	**19**	563	596	629	662	695	728
382	416	450	484	518	552	**20**	586	620	654	688	722	756
399	434	469	504	539	574	**21**	609	644	679	714	749	784
416	452	488	524	560	596	**22**	632	668	704	740	776	812
433	470	507	544	581	618	**23**	655	692	729	766	803	840
450	488	526	564	602	640	**24**	678	716	754	792	830	868
467	506	545	584	623	662	**25**	701	740	779	818	857	896
484	524	564	604	644	684	**26**	724	764	804	844	884	924
501	542	583	624	665	706	**27**	747	788	829	870	911	952
518	560	602	644	686	728	**28**	770	812	854	896	938	980
535	578	621	664	707	750	**29**	793	836	879	922	965	1008
552	596	640	684	728	772	**30**	816	860	904	948	992	1036

7-Foot Ceilings

TABLE 12 (Cont.)
Square Feet in the Ceiling and Four Walls of a Room

FEET WIDE						Feet Long	FEET WIDE					
15	16	17	18	19	20		21	22	23	24	25	26
AREA SQUARE FEET							AREA SQUARE FEET					
297	314	331	348	365	382	**3**	399	416	433	450	467	484
326	344	362	380	398	416	**4**	434	452	470	488	506	524
355	374	393	412	431	450	**5**	469	488	507	526	545	564
384	404	424	444	464	484	**6**	504	524	544	564	584	604
413	434	455	476	497	518	**7**	539	560	581	602	623	644
442	464	486	508	530	552	**8**	574	596	618	640	662	684
471	494	517	540	563	586	**9**	609	632	655	678	701	724
500	524	548	572	596	620	**10**	644	668	692	716	740	764
529	554	579	604	629	654	**11**	679	704	729	754	779	804
558	584	610	636	662	688	**12**	714	740	766	792	818	844
587	614	641	668	695	722	**13**	749	776	803	830	857	884
616	644	672	700	728	756	**14**	784	812	840	868	896	924
645	674	703	732	761	790	**15**	819	848	877	906	935	964
674	704	734	764	794	824	**16**	854	884	914	944	974	1004
703	734	765	796	827	858	**17**	889	920	951	982	1013	1044
732	764	796	828	860	892	**18**	924	956	988	1020	1052	1084
761	794	827	860	893	926	**19**	959	992	1025	1058	1091	1124
790	824	858	892	926	960	**20**	994	1028	1062	1096	1130	1164
819	854	889	924	959	994	**21**	1029	1064	1099	1134	1169	1204
848	884	920	956	992	1028	**22**	1064	1100	1136	1172	1208	1244
877	914	951	988	1025	1062	**23**	1099	1136	1173	1210	1247	1284
906	944	982	1020	1058	1096	**24**	1134	1172	1210	1248	1286	1324
935	974	1013	1052	1091	1130	**25**	1169	1208	1247	1286	1325	1364
964	1004	1044	1084	1124	1164	**26**	1204	1244	1284	1324	1864	1404
993	1034	1075	1116	1157	1198	**27**	1239	1280	1321	1362	1403	1444
1022	1064	1106	1148	1190	1232	**28**	1274	1316	1358	1400	1442	1484
1051	1094	1137	1180	1223	1266	**29**	1309	1352	1395	1438	1481	1524
1080	1124	1168	1212	1256	1300	**30**	1344	1388	1432	1476	1520	1564

Explanation—For the total square feet in a room 20 feet wide and 30 feet long, ceiling 7-feet high, run down the 20-ft. column and opposite 30 read 1300 square feet.

TABLE 12 (Cont.)
Square Feet in the Ceiling and Four Walls of a Room

8-Foot Ceilings

FEET WIDE							FEET WIDE					
3	4	5	6	7	8	Feet Long	9	10	11	12	13	14
AREA SQUARE FEET							AREA SQUARE FEET					
105	124	143	162	181	200	**3**	219	238	257	276	295	314
124	144	164	184	204	224	**4**	244	264	284	304	324	344
143	164	185	206	227	248	**5**	269	290	311	332	353	374
162	184	206	228	250	272	**6**	294	316	338	360	382	404
181	204	227	250	273	296	**7**	319	342	365	388	411	434
200	224	248	272	296	320	**8**	344	368	392	416	440	464
219	244	269	294	319	344	**9**	369	394	419	444	469	494
238	264	290	316	342	368	**10**	394	420	446	472	498	524
257	284	311	338	365	392	**11**	419	446	473	500	527	554
276	304	332	360	388	416	**12**	444	472	500	528	556	584
295	324	353	382	411	440	**13**	469	498	527	556	585	614
314	344	374	404	434	464	**14**	494	524	554	584	614	644
333	364	395	426	457	488	**15**	519	550	581	612	643	674
352	384	416	448	480	512	**16**	544	576	608	640	672	704
371	404	437	470	503	536	**17**	569	602	635	668	701	734
390	424	458	492	526	560	**18**	594	628	662	696	730	764
409	444	479	514	549	584	**19**	619	654	689	724	759	794
428	464	500	536	572	608	**20**	644	680	716	752	788	824
447	484	521	558	595	632	**21**	669	706	743	780	817	854
466	504	542	580	618	656	**22**	694	732	770	808	846	884
485	524	563	602	641	680	**23**	719	758	797	836	875	914
504	544	584	624	664	704	**24**	744	784	824	864	904	944
523	564	605	646	687	728	**25**	769	810	851	892	933	974
542	584	626	668	710	752	**26**	794	836	878	920	962	1004
561	604	647	690	733	776	**27**	819	862	905	948	991	1034
580	624	668	712	756	800	**28**	844	888	932	976	1020	1064
599	644	689	734	779	824	**29**	869	914	959	1004	1049	1094
618	664	710	756	802	848	**30**	894	940	986	1032	1078	1124

8-Foot Ceilings

TABLE 12 (Cont.)
Square Feet in the Ceiling and Four Walls of a Room

FEET WIDE						Feet Long	FEET WIDE					
15	16	17	18	19	20		21	22	23	24	25	26
AREA SQUARE FEET							AREA SQUARE FEET					
333	352	371	390	409	428	**3**	447	466	485	504	523	542
364	384	404	424	444	464	**4**	484	504	524	544	564	584
395	416	437	458	479	500	**5**	521	542	563	584	605	626
426	448	470	492	514	536	**6**	558	580	602	624	646	668
457	480	503	526	549	572	**7**	595	618	641	664	687	710
488	512	536	560	584	608	**8**	632	656	680	704	728	752
519	544	569	594	619	644	**9**	669	694	719	744	769	794
550	576	602	628	654	680	**10**	706	732	758	784	810	836
581	608	635	662	689	716	**11**	743	770	797	824	851	878
612	640	668	696	724	752	**12**	780	808	836	864	892	920
643	672	701	730	759	788	**13**	817	846	875	904	933	962
674	704	734	764	794	824	**14**	854	884	914	944	974	1004
705	736	767	798	829	860	**15**	891	922	953	984	1015	1046
736	768	800	832	864	896	**16**	928	960	992	1024	1056	1088
767	800	833	866	899	932	**17**	965	998	1031	1064	1097	1130
798	832	866	900	934	968	**18**	1002	1036	1070	1104	1138	1172
829	864	899	934	969	1004	**19**	1039	1074	1109	1144	1179	1214
860	896	932	968	1004	1040	**20**	1076	1112	1148	1184	1220	1256
891	928	965	1002	1039	1076	**21**	1113	1150	1187	1224	1261	1298
922	960	998	1036	1074	1112	**22**	1150	1188	1226	1264	1302	1340
953	992	1031	1070	1109	1148	**23**	1187	1226	1265	1304	1343	1382
984	1024	1064	1104	1144	1184	**24**	1224	1264	1304	1344	1384	1424
1015	1056	1097	1138	1179	1220	**25**	1261	1302	1343	1384	1425	1466
1046	1088	1130	1172	1214	1256	**26**	1298	1340	1382	1424	1466	1508
1077	1120	1163	1206	1249	1292	**27**	1335	1378	1421	1464	1507	1550
1108	1152	1196	1240	1284	1328	**28**	1372	1416	1460	1504	1548	1592
1139	1184	1229	1274	1319	1364	**29**	1409	1454	1499	1544	1589	1634
1170	1216	1262	1308	1354	1400	**30**	1446	1492	1538	1584	1630	1676

Explanation—For the total square feet in a room 20 feet wide and 30 feet long, ceiling 8 feet high, run down the 20-ft. column and opposite 30 read 1400 square feet.

TABLE 13

American Steel & Wire Steel Wire Gauge

	American Steel & Wire Division's STEEL WIRE GAUGE No.	SIZES OF WIRE		Weight One Mile Pounds	Pounds per Foot	Feet to Pound
		Common Fractions	Decimally			
	1		.2830	1128.0	.2136	4.681
		9/32	.28125	1114.0	.211	
	2					
			.2625	970.4	.1838	5.441
		1/4	.250	880.2	.1667	
	3		.2437	836.4	.1584	6.313
	4		.2253	714.8	.1354	7.386
		7/32	.21875	673.9	.1276	
	5		.2070	603.4	.1143	8.750
	6		.1920	519.2	.0983	10.17
		3/16	.1875	495.1	.0937	
	7		.1770	441.2	.0835	11.97
	8		.1620	369.6	.070	14.29
		5/32	.15625	343.8	.0651	
	9		.1483	309.7	.0586	17.05
	10		.1350	256.7	.0486	20.57
		1/8	.1250	220.0	.0416	
	11		.1205	204.5	.0387	25.82
	12		.1055	156.7	.0296	33.69
		3/32	.09375	123.8	.0234	
	13		.0915	117.9	.0223	44.78
	14		.0800	90.13	.0170	58.58
	15		.0720	73.01	.0138	72.32
	16	1/16	.0625	55.0	.0104	95.98
	17		.0540	41.07	.0077	128.6
	18		.0475	31.77	.006	166.2
	19		.0410	23.67	.0044	223.0
	20		.0348	17.05	.0032	309.6

LIST OF WIRE AND WIRE PRODUCTS made by AMERICAN STEEL & WIRE DIVISION

Airplane Wires and Strand
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Annunciator Wire
Automobile Springs
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Baler Wire
Ball Wire
Barbed Wire
Beam and Cable Type Guard Rails
Bookbinding Wire
Broom Wire
Cold Finished Steel Bars
Cold Rolled Strip Steel
Copper Wire
Door Springs
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Elevator Cables
Farm Gates
Fences, Field & Poultry, Diamond Lawn, Ellwood
Fence Posts, Steel, Line, End & Corner
Fence Tools
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Florist Wire
Galvanized Wire
High Carbon Wires
Highway Guard Wire Cables
Interlocked Armored Cable
Lawn Fence and Lawn Gates
Low Carbon Wires
Magnet Wire
Mining Machine Cables
Nails of every description (Wire)
Piano Wire
Plain Wire
Poultry Netting—Hexcel
Power Cables
Rail Bonds
Rubber Covered Power Cables
Signal Bonds
Signal Wire
Spikes
Springs of every description
Spring Wire
Stainless Steel Nails
Stainless Steel—Strip and Wire
Staples—Galvanized and Polished
Strand and Wire for Prestressed Concrete
Submarine Power Cables
Tacks
Telephone and Telegraph Wire
Varnished Cambric Cables
Welded Wire Fabric for Concrete Reinforcement
Welding Wire
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Wire Hoops
Wire Rope
Wire Strand
Wire Rods

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LITERATURE

Descriptive literature is available for most product mentioned above. Please address your requests to Literature Department, American Steel & Wire Division, United States Steel, Rockefeller Building, Cleveland 13, Ohio.

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